

Technical Service Guide

January 2017

Monogram® 36" 42" 48" Built-In Side By Side Refrigerators

ZISB360DKBSS	ZIS480NKB
ZISB360DKCSS	ZIS480NKC
ZISS360DKBSS	ZISB480DKB
ZISS360DKCSS	ZISB480DKC
	ZISP480DKBSS
ZIS420NKB	ZISP480DKCSS
ZIS420NKC	ZISS480DKBSS
ZISB420DKB	ZISS480DKCSS
ZISB420DKC	ZISS480NKBSS
ZISP420DKBSS	ZISS480NKCSS
ZISP420DKCSS	
ZISS420DKBSS	
ZISS420DKCSS	
ZISS420NKBSS	
ZISS420NKCSS	



Safety Information



IMPORTANT SAFETY NOTICE

The information in this service guide is intended for use by individuals possessing adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

WARNING

To avoid personal injury, disconnect power before servicing this product. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks.

RECONNECT ALL GROUNDING DEVICES

If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

GE Appliances

Technical Service Guide

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Safety Requirements

GE Factory Service Employees are required to use safety glasses with side shields, safety gloves and steel toe shoes for all repairs.



Steel Toed Work Boot



Electrically Rated Glove and
Dyneema® Cut Resistant
Glove Keeper



Dyneema® Cut Resistant
Glove



Cut Resistant Sleeve(s)



Plano Type Safety Glasses



Brazing Glasses



Prescription Safety Glasses
Safety Glasses must be ANSI
Z87.1-2003 compliant



Prior to disassembly of the refrigerator to access components, GE Factory Service technicians are **REQUIRED** to follow the Lockout / Tagout (LOTO) 6 Step Process:

Step 1 Plan and Prepare	Step 4 Apply LOTO device and lock
Step 2 Shut down the appliance	Step 5 Control (discharge) stored energy
Step 3 Isolate the appliance	Step 6 "Try It" verify that the appliance is locked out

Nomenclature

Z I S S 4 2 0 D K B S S

Brand

Z - Monogram

Installation

I - Built-in

Configuration

S - Side-by-side refrigerator

Door Panel

B - Black Dispenser

P - Professional

S - Stainless wrap panel or European

No designation - custom panel

Handle Options

SS - Stainless case/handle

Engineering Digit

Model Year

2016

Dispenser

D - Ice and water dispenser

N - No dispenser

Flush or Integrated

0 - Flush-inset, 3/4" overlay or 1/4" framed

Width

36", 42", or 48"

The nomenclature breaks down and explains what the letters and numbers mean in the model number.

Serial Number

The first two characters of the serial number identify the month and year of manufacture. The letter designating the year repeats every 12 years.

Example: LA123456S = June, 2013

A - JAN 2024 - Z

D - FEB 2023 - V

F - MAR 2022 - T

G - APR 2021 - S

H - MAY 2020 - R

L - JUN 2019 - M

M - JUL 2018 - L

R - AUG 2017 - H

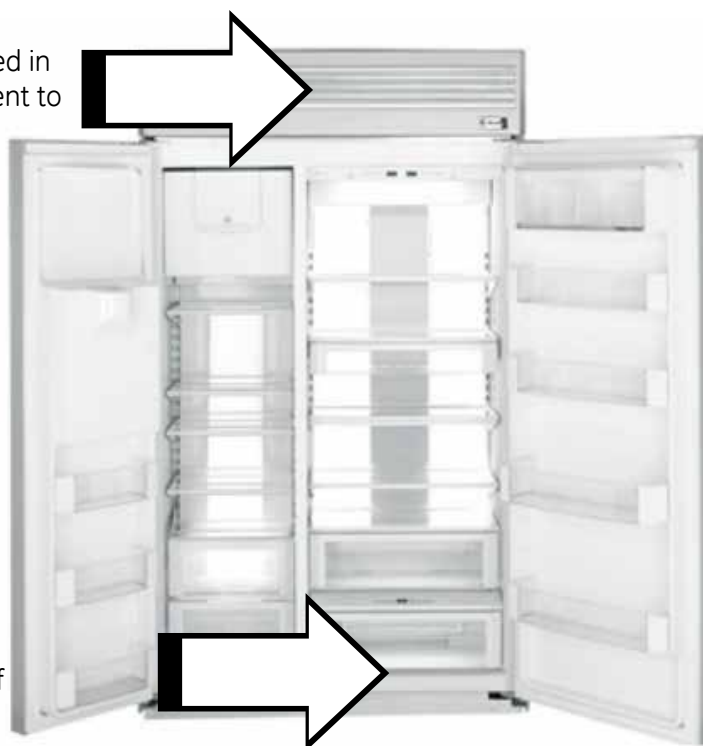
S - SEP 2016 - G

T - OCT 2015 - F

V - NOV 2014 - D

Z - DEC 2013 - A

The Mini Manual is located in the machine compartment to the left of the inverter.



The Model Serial ID Tag is located under the custom cool drawer on the right side of the fresh food floor.

Introduction

Monogram introduces the 2016 36", 42" and 48" Built-in Side by Side Refrigerators with Wi-Fi connectivity. The refrigerators are available in three styles: European, Professional, and custom panel.

All LED lighting illuminates the fresh food and freezer sections with crisp clear lighting throughout the interior. The adjustable aluminum-trimmed glass shelves allow convenient visible access to contents in the fresh food section.

The freezer features a factory installed icemaker. With the use of GE water filtration, the icemaker produces filtered ice cubes. Adjustable wire shelves and two baskets provide ample storage for frozen goods.

Cooling is achieved through the use of a variable speed compressor and a single evaporator. A freezer fan and electrical damper regulate the airflow into the fresh food section. Advanced temperature management with a multi-shelf air tower provides even distribution of air throughout the refrigerator.

Upfront electronic controls with a digital read-out offer a range of temperature settings for both compartments. A Custom Cool drawer gives the capability to express chill beverages, express thaw meats, and select specific temperatures for perishable foods.

Additional Features

- Dairy Bin with center divider
- Filter change indicator
- Sabbath Kit available
- Hidden door hinges
- 90, 115, or 130 degree door stops
- Master Light control switches
- Stainless steel finish
- Stainless steel handles
- Made In America

NOTE: Features may vary by model.

Technical Data

MONOGRAM - ZISS360, ZISB360, ZIS420, ZISP420, ZISS420, ZISB420, ZIS480, ZISP480, ZISS480, ZISB480



Electrical Shock Hazard

Death or serious injury can result from failure to follow these instructions.

- **Service by a qualified service technician only.**
- Disconnect power before servicing this product.
- Reconnect all grounding devices after service.
- Replace all parts and panels before operating.



To avoid personal injury when servicing the condensing unit, stand on a ladder which will give enough support to allow removal of the top panel and safely allow access to service the unit.

ELECTRICAL SPECIFICATIONS

Max Defrost Control

w/No Door Openings 96 hrs @ 45 min

Evap Defrost Thermodisc 140°F - 110°F

Electrical Rating: 110 - 127 VAC 10.0 amp
60 Hz

Maximum Current Leakage 0.75 mA

Maximum Ground Path Resistance 0.14 ohms

NO LOAD PERFORMANCE

CONTROL POSITION 37°F - 0°F and

AMBIENT TEMPERATURE OF 70°F 90°F

Fresh Food, °F 35 - 39 35 - 39

Frozen Food, °F (-4) - (4) (-4) - (4)

Percent Running Time 50 80

REFRIGERATION DIAGNOSIS

To access the low pressure side of the system, install a WJ56X61 valve only on the process tube extending from the compressor case.

REFRIGERATION SYSTEM

Minimum Compressor Capacity

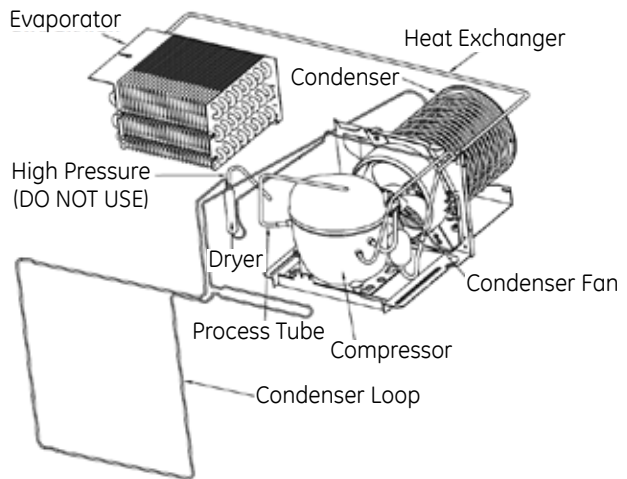
Vacuum 22 inches

Minimum Equalized Pressure

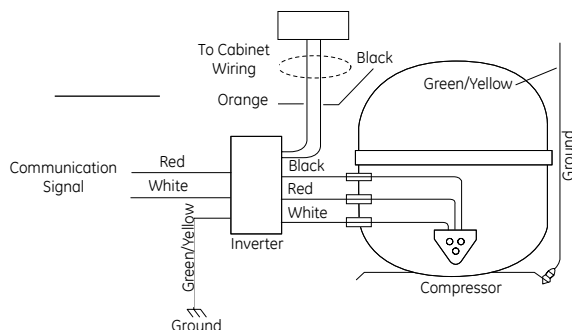
@ 70°F 65/65 PSIG

@ 90°F 79/80 PSIG

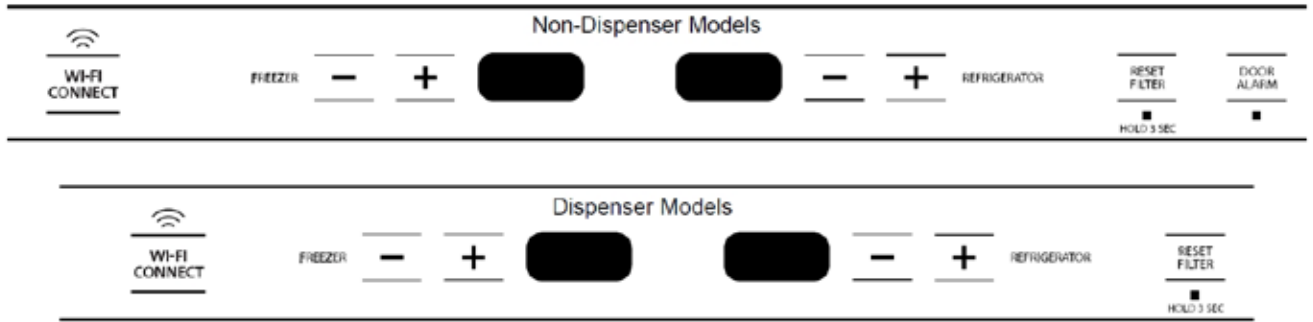
R134a Refrig. Chg 8.50 oz



NOTE: Fan blade mounted for maximum airflow with .150" of shaft exposed.



Operating Instructions



Temperature Controls

The temperature display shows the actual temperature of the freezer and fresh food compartments. The actual temperature will vary from the set temperature based on factors such as frequency of door opening, amount of food, defrost cycling and room temperature.

NOTE: Frequent door openings or a door left open for periods of time may increase the internal temperature of the freezer and fresh food compartments temporarily.

To turn off the cooling system in both the freezer and fresh food compartments, press either "+" pad until both displays show OFF.

To turn the cooling system on, press either "-" pad. The preset temperatures of 0°F and 37°F will appear in the displays.

To check the current temperature setting for the fresh food or freezer compartment, press the "+" or "-" pad once. After 5 seconds, the display will return to the actual temperature.

To change the temperature settings, press the "+" or "-" pads to desired temperature set point for fresh food and freezer separately. Allow 24 hours for the refrigerator to reach the temperature that has been set.

Temperature Range

	Low	High
Fresh Food	34°F 1°C	42°F 5°C
Freezer	-6°F -21°C	+4°F -15°C

NOTE: Setting the controls to OFF stops cooling, but does not shut off electrical power to the refrigerator.

Changing Between °C/°F

The display temperature can be changed from Fahrenheit to Celsius through Service Mode (see the **Diagnostic Mode** section in this service guide for more information).

Wi-Fi Connect

The refrigerators are Monogram Wi-Fi Connect Enabled. A Wi-Fi communication card is built into the refrigerator allowing it to communicate with a Smart Phone for remote monitoring, control, and notifications. Press the Wi-Fi button to activate Monogram Connect. For issues concerning connectivity, the consumer should call 1-800-220-6899.



Door Alarm

To turn the Door Alarm feature on, press the pad once. The ACTIVE light will come on. To turn it off, press the pad again.

When the **DOOR ALARM** is active, the alarm will flash and beep if the door is kept open for more than 2 minutes.



Sabbath Mode

Sabbath mode requires the use of an accessory kit (**Part #:** ZSAB1).

DISPLAYS, ALARMS and LIGHTS: The main temperature control, door alarms and lights will be disabled.

Installation

Refrigerator Location

The refrigerators should not be installed in an area where one of the follow conditions exist:

- Ambient temperatures go below 55°F (13°C) as the refrigerator will not run enough to maintain proper temperatures.
- Ambient temperatures exceed 100°F (37°C).
- The refrigerator is exposed to water (rain, etc.) or direct sunlight.
- Flooring is unlevelled or not strong enough to support the refrigerator when fully loaded (approximately 1,500 lbs).

Additional Specifications

- 115 volt 60Hz., 15 or 20 amp power supply is required.
- An individual properly grounded branch circuit or circuit breaker is recommended.

NOTE: A GFI (Ground Fault Interrupter) is not recommended.

WARNING **Electrical Shock Hazard**

- It is required that the refrigerator be plugged into a grounded 3-prong outlet.
- The ground prong should not be removed.
- Use of a 2-prong adapter or an extension cord is prohibited.
- Any frayed or damaged power cord should immediately be replaced.

Water Line

A cold water supply is required for automatic icemaker operation. The water pressure must be between 40 psi and 120 psi.

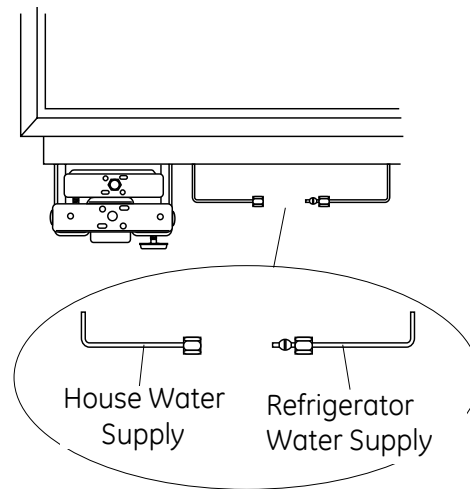
Route 1/4 in. OD copper or GE SmartConnect™ plastic tubing between the house cold water line and the water connection location.

The tubing should be long enough to extend to the front of the refrigerator. Allow enough tubing to accommodate the bend leading into the water line connection.

NOTE: The only GE-approved plastic tubing is supplied in the GE SmartConnect™ Refrigerator Tubing Kits. Do not use any other plastic water supply line, because the line is under pressure at all times. Other types of plastic may crack or rupture with age and cause water damage to the home.

GE SmartConnect™ Refrigerator Tubing Kits are available in the following lengths:

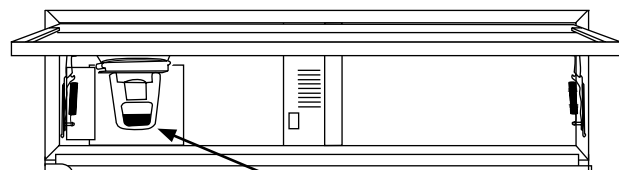
- 2 Feet (.6 m): (**Part #:** WX08X10002)
- 8 Feet (2.4 m): (**Part #:** WX08X10006)
- 15 Feet (4.6 m): (**Part #:** WX08X10015)
- 25 Feet (7.6 m): (**Part #:** WX08X10025)



NOTE: Saddle type shut-off valves are included in many water supply kits, but are not recommended for this application.

ATTENTION: Commonwealth of Massachusetts Plumbing Codes 248CMR shall be adhered to. Saddle valves are illegal and use is not permitted in Massachusetts. Consult with a licensed plumber.

If the water supply to the refrigerator is from a Reverse Osmosis Water System (R.O.), use the refrigerator's filter bypass plug. Using the refrigerator's water filtration cartridge with the R.O. filter can result in hollow ice cubes.



Anti-Tip



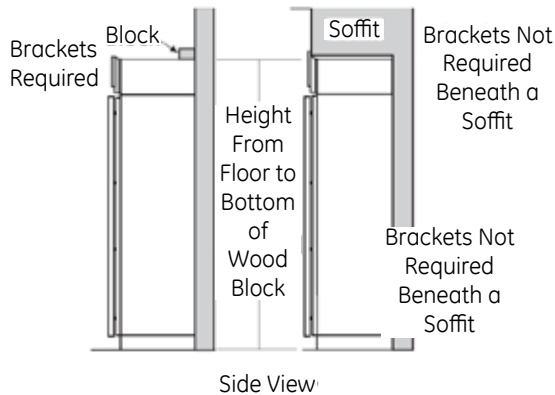
WARNING



Tip Over Hazard!

These refrigerators are top heavy, especially with any doors open, and **must** be secured to prevent tipping forward which could result in death or serious injury.

If there is no soffit, a 2" x 4" block, 35" long with supplied mounting brackets may be used to secure the refrigerator.

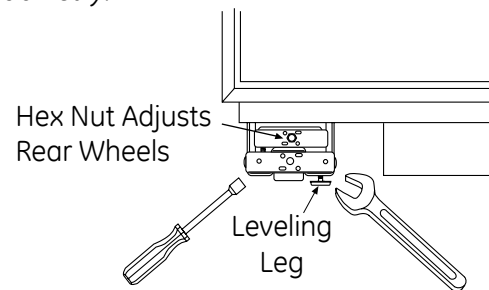


IMPORTANT: When the refrigerator is installed under a soffit, or if there is not enough height for this method of security using the anti-tip wall bracket, proceed to **Level Refrigerator** for leveling instructions and then to **Secure Refrigerator To Cabinetry** to secure the refrigerator to the cabinets.

Level Refrigerator

All models have 4-point leveling. The front is supported by leveling legs, the rear is supported by adjustable wheels. Both are accessible from the front of the refrigerator.

- To level the back of the refrigerator, turn the 7/16 in. hex nut located above the front wheels. Turn clockwise to raise, or counter-clockwise to lower the refrigerator.
- For front leveling, use a 1-1/4 in. open-end wrench.
- Adjust height of refrigerator to match installation cutout opening 84-1/2 inches. The refrigerator should be level and plumb with the cabinetry.



CAUTION

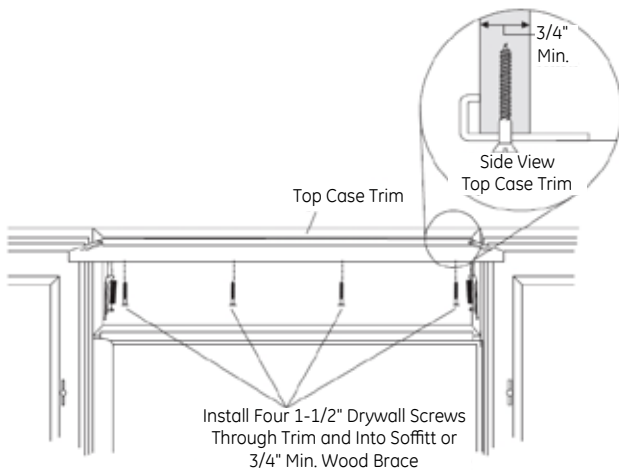
The rear leveling wheels and front leveling legs are limited to a maximum height adjustment of 1 inch. If the installation requires more than 84-1/2 inch height, the installer should elevate the refrigerator on a sheet of plywood or runners. Cabinetry trim could also be added across the top of the opening to shorten the opening. **Any attempt to raise the refrigerator more than 1 inch will damage the front leveling legs and the rear leveling wheels. Make adjustments in small increments**

Secure Refrigerator to Cabinetry

One of the below methods for securing the refrigerator to the cabinetry should be performed when the refrigerator is installed under a soffit. The refrigerator must be secured to prevent tipping.

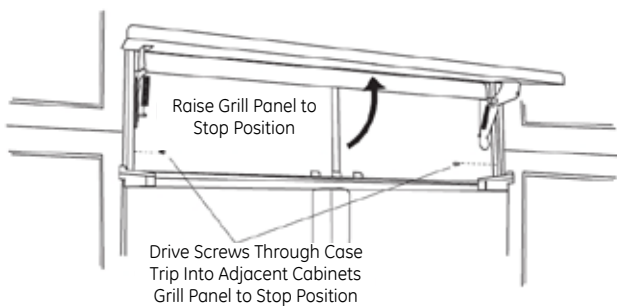
Method 1:

1. Raise the grill panel to access the case trim.
2. Drill four evenly spaced 3/16 in. holes through the metal top case.
3. Install four 1-1/2 in. drywall screws into the soffit or wood brace.



Method 2:

1. Raise the grill panel to access the case trim.
2. Drill two 3/16 in. pilot holes through the metal clearance holes and into the soffit.
3. Install two 1-1/2 in. drywall screws into adjacent cabinets through side case trim.



Fresh Food Door

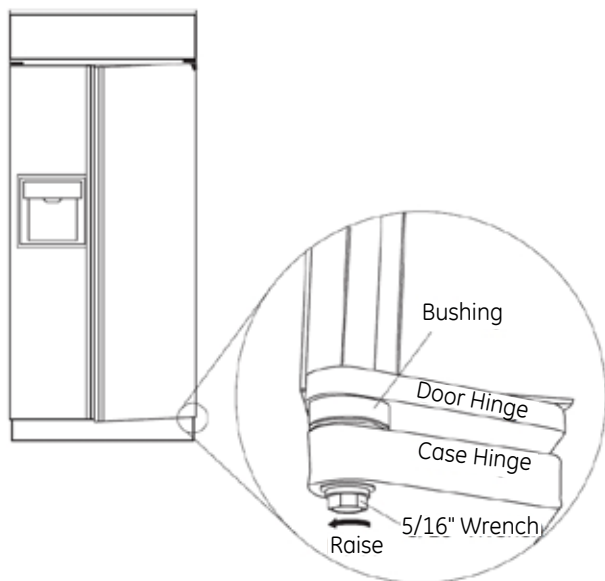
Door Alignment

Stand away from the refrigerator to inspect the door alignment.

Installation or the addition of heavy door panels may have caused the doors to move slightly out of alignment. Check to be sure the top of the doors are evenly aligned with each other. If necessary, the right-hand door may be adjusted up or down to align.

Adjusting Right-Hand Door

Use a 5/16 in. wrench to raise or lower the hinge pin as shown below.



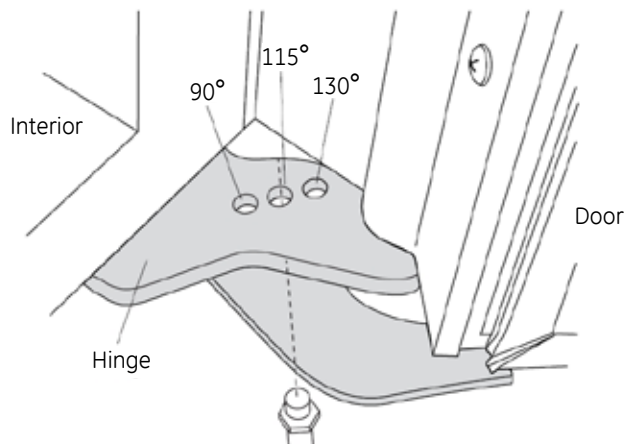
Adjust Door Swing

All models have a 3 position adjustable door stop and are shipped at the 115 degree position. Each door stop can be adjusted to 130 degrees, or 90 degrees if the clearance adjacent to the cabinetry or walls is limited.

NOTE: The use of the 90 degree door stop position will allow for pan access, but restricts pan removal.

1. Open the door to view the bottom hinge. Make note of the door stop pin locations.

2. Close the door.
3. From below, use pliers or a 1/2 in. wrench to unscrew the door stop and reinstall into the 130 or 90 degree position.

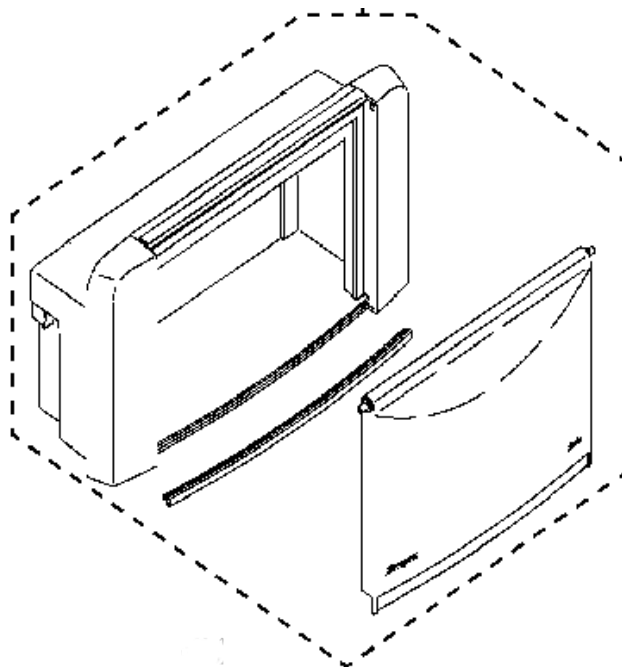


Dairy Bin

The dairy bin has a center divider and a magnetic seal at the bottom of the bin. The magnetic seal helps keep the freshness of the contents of the bin. The dairy bin is an assembly that includes the magnetic seal, bin, and bin door.

Dairy Bin Removal

- Lift the bin up and slide it away from the door.

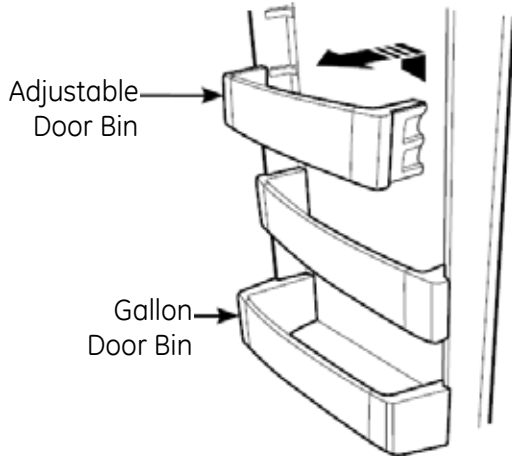


Door Bins

All door bins, except for the dairy bin and the deep gallon door bin, are adjustable using one of two tabs on each end of the bin.

Door Bins Removal

- Lift the bin up and slide it away from the door.



Fresh Food Door Gasket

Door gaskets are magnetic and create a positive seal to the steel cabinet. The gaskets are push-in style and are held in place by a retainer channel build into the door.

Replacing the Gasket

- Soak the new gasket in warm water to make it pliable (soak until any folds from shipping are smoothed).



- Starting at any corner, pull the old gasket out of the retaining channel.
- Soak the new gasket in warm water to make it pliable (soak until any folds from shipping are smoothed).
- Push the backside of the gasket into the retainer channel.

Fresh Food Door Removal

Starting at the bottom of the door:

- Remove three Philips head screws holding the toe kick and set the toe kick aside.
- Using 3/16 in. Allen wrench, remove the screw holding the closure mechanism.

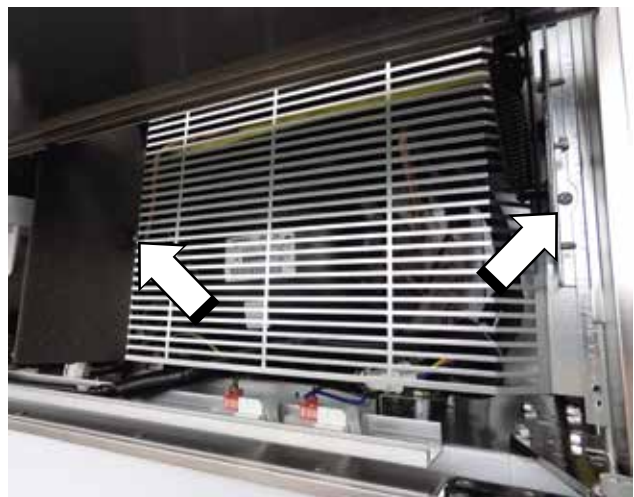


Moving to the top of the door:

- Lift the machine cover up.
- Remove three Philips head screws, lift up on the switch trim, and set the trim aside.



- Remove two Philips head screws and set the compressor grill to the side (the screw to the left is hidden under the foam baffle).



- Remove four 3/8 in. bolts securing the upper door hinge.
- Open and lift up on the door to remove the door from the lower hinge.

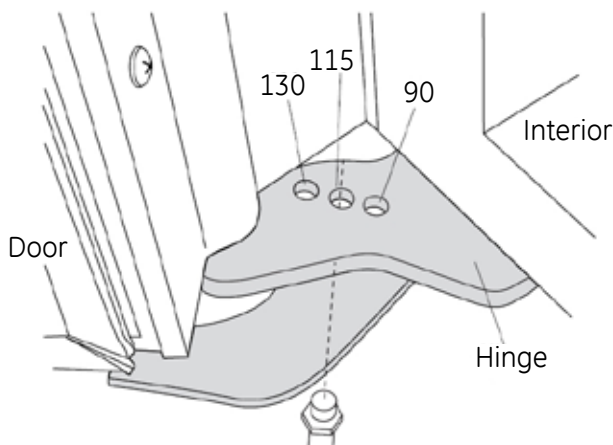
Freezer Door

Adjust Door Swing

All models have a 3 position adjustable door stop and are shipped at the 115 degree position. Each door stop can be adjusted to 130 degrees, or 90 degrees if the clearance adjacent to the cabinetry or walls is limited.

NOTE: The use of the 90 degree door stop position will allow for pan access but restricts pan removal.

1. Open the door to view the bottom hinge. Note the door stop pin locations.
2. Close the door.
3. From below, use plier or a 1/2" wrench to unscrew the door stop and reinstall into the 130 or 90 degree position.

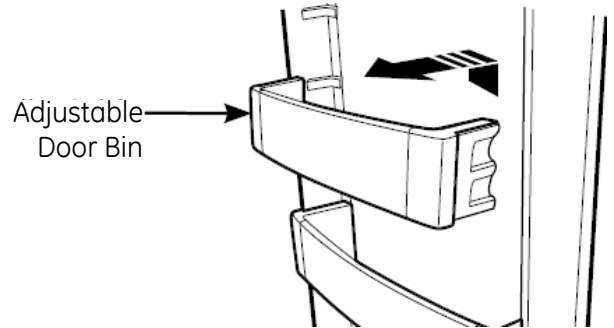


Freezer Door Bins

The freezer door bins are adjustable using one of two tabs on each bin and can be moved up or down.

Freezer Door Bin Removal

- Lift up and slide the bin forward.



Freezer Door Gasket

Door gaskets are magnetic and create a positive seal to the steel cabinet. The gaskets are push-in style and are held in place by a retainer channel build into the door.

Gasket Replacement

1. Soak the new gasket in warm water to make it pliable (soak until any folds from shipping are smoothed).



2. Starting at any corner, pull the old gasket out of the retaining channel.
3. Soak the new gasket in warm water to make it pliable (soak until any folds from shipping are smoothed).
4. Push the backside of the gasket into the retainer channel.

Dispenser Board

Some models have an ice and water dispenser that utilizes a glass touch dispenser board. The dispenser board is equipped with a proximity sensor that causes the panel to light up as someone approaches the dispenser (approximately 2 inches away). The dispenser board will give the user the option to select water, crushed or cubed ice, turn on the dispenser LED lighting and turn on the door alarm, and lock the dispenser board. When a selection is made, the halo for that feature will illuminate. The lighted graphics will automatically switch off when the individual walks away from the dispenser. The dispenser board receives 13 VDC from the main board and sends power to the duct door solenoid and dispenser LEDs when called upon.

Dispenser Board Removal

1. Remove the dispenser trim panel (for custom panel models) or stainless steel wrapper (for stainless steel models).
 - To remove the trim from a custom panel model, pull the panel forward to release the clips from the door panel.



- To remove the wrapper, remove three Philips head screws at the top of the door, three Philips head screws at the bottom of the door, and six Philips head screws on the left side of the door (the door will need to be in the open position to remove the six screws on the left). Finally, remove the wrapper by pulling the right side away from the door, then the hinge side.

2. Lift up and pull out on the bottom of the dispenser board to release the bottom two tabs, securing the board to the cradle assembly.



3. Disconnect three wiring connectors from the dispenser board and two wiring connectors from the dispenser LED board.



Dispenser Board Diagnosing

The supply voltage for the dispenser board can be checked at three locations:

Main Board:

- J4 pin 2 (**brown**) J4 pin 5 (**red**) = 13.6 VDC
- J4 pin 2 (**brown**) to J4 pin 3 (**orange**) = 13.6 VDC

Door connector:

- **Brown** wire to **Red** wire = 13.6 VDC
- **Brown** wire to **Orange** wire = 13.6 VDC

Dispenser board:

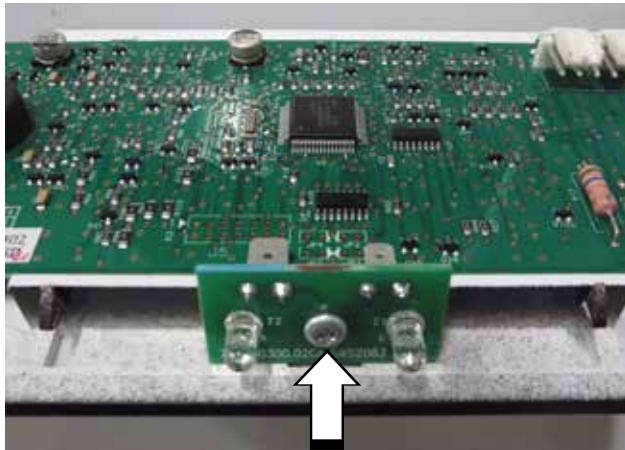
- J4 pin 1 (**red**) to J4 pin 2 (**red/brown**) = 13.6 VDC
- J4 pin 2 (**red/brown**) to J4 pin 3 (**orange**) = 13.6 VDC

Dispenser LEDs

Mounted to the underside of the dispenser board assembly is an LED board. The LED board has two LEDs which are controlled by the dispenser board. The LEDs will illuminate when the cradle is pressed (ice or water dispensing) or when the light icon is touched on the dispenser board.

LED Board Removal

1. Follow steps 1 - 2 of **Dispenser Board Removal** in the **Dispenser Board** section of this guide.
2. Disconnect the **red** and **white** wires from the LED board.
3. Remove the T15 Torx head screw at the bottom of the dispenser board.



LED Board Diagnosing

The dispenser LED board receives 13.6 VDC from the dispenser board. Voltage can be checked at the LED board or dispenser board.

Dispenser Board:

(when light button is selected from dispenser board)

- J3 pin 3 (**red**) to J3 pin 2 (**white**) = 13.6 VDC

(when paddle switch is activated during dispensing)

- J3 pin 4 (**grey**) to J3 pin 2 (**white**) = 13.6 VDC

Recess Housing

Removing the recess housing allows for access to the paddle switch, ice funnel, paddle, duct door, and duct door solenoid. The paddle, paddle switch, and ice funnel are connected to the recess housing, but are all individual parts.

Recess Housing Removal

- Remove the dispenser board.
- Remove four Philips head screws.



- Slide the recess housing forward.

Paddle Switch

The paddle switch is located on the left side of the recess housing. The switch is a normally open reed switch which is activated by pressing the paddle.

Paddle Switch Removal

- Remove the dispenser board.
- Remove the recess housing.
- Remove one Philips head screw.



Duct Door

The duct door is a round insulated door that opens to allow crushed and cubed ice to pass through the door. If the duct door is not sealing properly, frost may form in the chute. When this occurs, check that the duct door solenoid is not stuck, and the duct door is flush against the door. If the duct door is not flush, it will need to be replaced.

Duct Door Removal

1. Lift the duct door open.
2. Unclip the top of the duct door from the door crank.
3. Lift the bottom of the duct door off the door crank.



Duct Door Solenoid

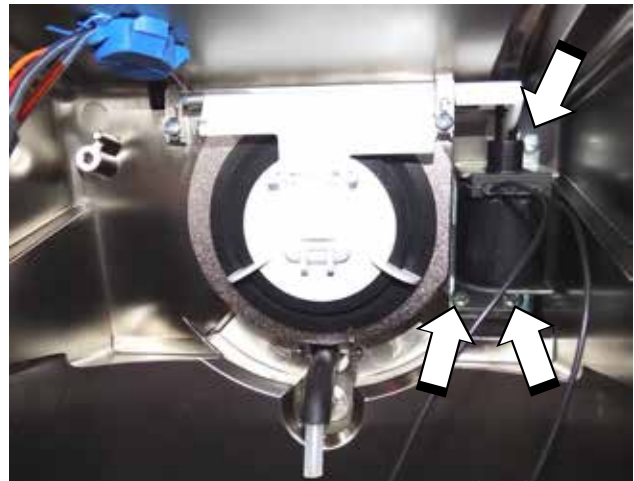
The duct door solenoid receives 13 VDC from the dispenser board when the paddle switch is activated during crushed or cubed ice dispensing. When voltage is applied to the solenoid, the plunger of the solenoid pulls down on the crank arm to open the duct door.

Duct Door Solenoid Diagnosing

The duct door has a resistance of 12.8 ohms. Voltage and resistance can be checked at the two pin connector with **black** wires on the dispenser board.

Duct Door Solenoid Removal

1. Remove the dispenser board.
2. Remove the lower two Philips head screws.
3. Loosen the top Philips head screw (leaving the top screw in place makes it easier to install the new solenoid).



Recess Heater

The recess heater is a heater in the door which keeps condensation to a minimum around the recess. The dispenser provides the heater with 13 VDC. If the heater fails the freezer door would need to be replaced.

Recess Heater Diagnosing

The recess heater has a resistance of 144 ohms. Check the resistance from the J4 connector of the dispenser board.

- J4 pin 2 (**red/brown**) to J4 pin 6 (**red**) = 144 ohms
- J4 pin 2 (**red/brown**) to J4 pin 6 (**red**) = 13 VDC

Freezer Door Removal (with Dispenser)

Starting at the bottom of the door:

1. Remove the three Philips head screws holding the toe kick and set the toe kick aside.
2. Disconnect 1/4 in. water line at the John Gest connection.



3. Using a 3/16 in. Allen wrench, remove the screw holding the closure mechanism.



Moving to the top of the door:

4. Lift the machine cover up.
5. Remove three Philips head screws, lift up on the stainless steel switch trim, and set the trim aside.



6. Remove one Philips head screw securing the door harness to the cabinet.
7. Disconnect the four pin connector for the door harness.
8. Remove four 3/8 in. bolts securing the upper door hinge.
9. Open and lift up on the door to remove the door and water line from the lower hinge.

NOTE: If replacing the upper hinge, the pins will need to be removed from the connector in order to pull the wiring through the hinge (the connector will need to be reused). If replacing the door, the wiring on the hinge side of the connector can be cut to remove the hinge, although the connector will still need to be reused for the replacement door wiring harness.

Door Water Line Union

The 1/4 in. freezer door water line is connected to the 5/16 in. water tank line by a 1/4 in. x 5/16 in. adapter. The 1/4 in. x 5/16 in. connector has a built-in check and should only be replaced with the part number listed in the parts catalogue.

Fresh Food

Fresh Food Interior Component Locator



May not be on all models.

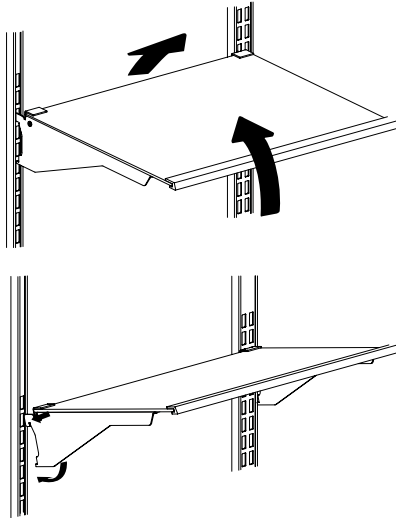
Shelves

Adjustable Shelves

Tempered glass shelves in the fresh food compartment enable efficient shelf arrangements that fit food storage needs.

To remove shelves: Tilt shelf up at front, then lift it up and out of tracks on rear wall of refrigerator.

To replace shelves: Select desired shelf height. With shelf front raised slightly, engage top lugs in tracks at rear of cabinet. Then, lower the front of shelf until it locks into position.

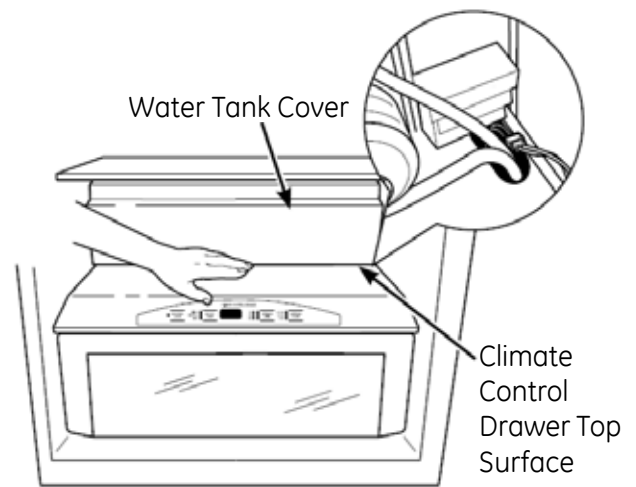


Lighted Vegetable Drawer Shelf

The lighted vegetable drawer shelf provides lighting for the vegetable drawer. The lights are recessed into the shelf to illuminate the drawer.

To remove the shelf:

1. Remove the top drawer (see **Drawer Removal**, in the **Drawers (Pans)** section of this service guide).
2. Push down gently on the back center of the climate control drawer top surface to release the bottom of the water tank cover. Pull out and down to remove the water tank cover and expose the wiring harness.

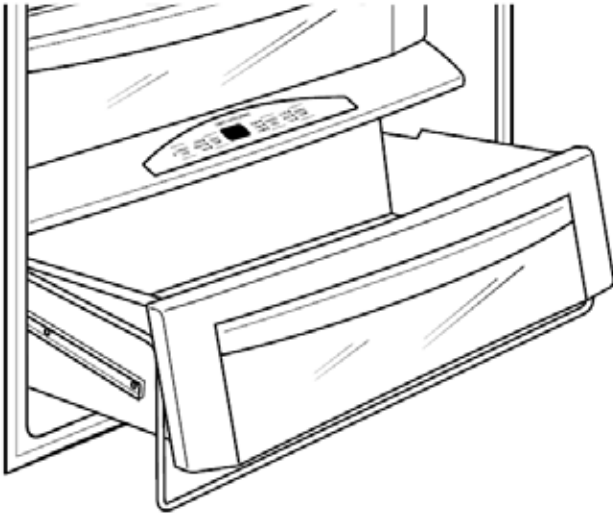


3. Lift the shelf and carefully pull forward to expose the wiring connector.
4. Unplug the shelf and remove it from the refrigerator.

Drawers (Pans)

Drawer Removal

1. Pull the drawer out to the stop position.
2. Lift the front of the drawer up and out of the wire holder.
3. Lift the back of the drawer up and out.



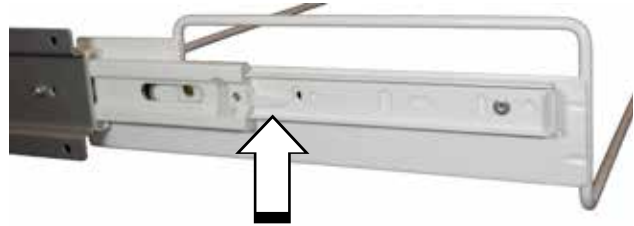
Drawers Replace

1. Place the back of the drawer in the wire holder, making sure the wire holder fits into the grooves on the back of the drawer.
2. Lower the front of the drawer into the wire holder.
3. Press firmly on the top of the drawer to snap it into the wire holder.

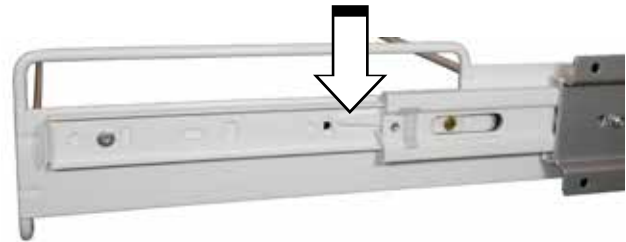
Wire Drawer Frame Removal

Each drawer has a wire holder which can be removed to access the water tank, tower LEDs, and Quick Chill components.

1. Pull the drawer out to the stop position.
2. Remove the drawer (see **Drawer Removal**, in the **Drawers (Pans)** section of this service guide).
3. Push up on the release tab on the left side while pulling the frame forward.



4. Push down on the release tab on the right side while pulling the frame forward.



Drawer Slides

There are six drawer slides in the fresh food section. The snack pan slides are riveted to mounting plates and must be replaced as an assembly.

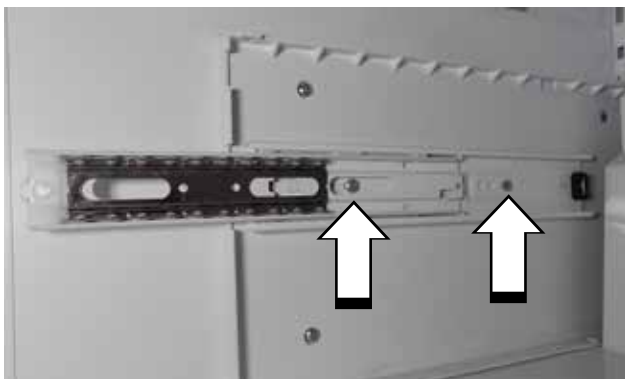
Snack Pan Slide Removal

1. Remove the shelf above the snack pan.
2. Remove the snack pan and the drawer frame.
3. Remove four Philips head screws securing the assembly to the cabinet.



Drawer Slide Removal

1. Remove the drawers.
2. Remove the wire drawer frames.
3. Remove the shelf above the snack pan and the LED shelf.
4. Slide the inside rail of the slide forward and remove the two Philips head screws.



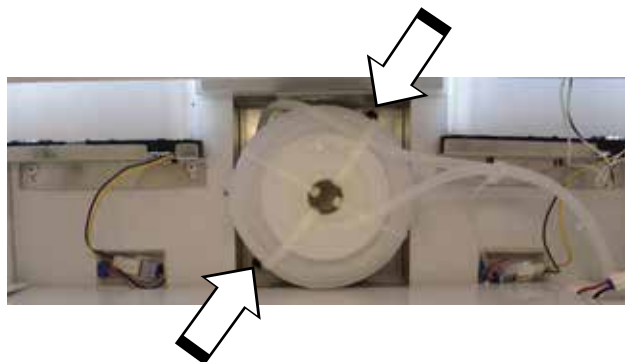
NOTE: Removing the Custom Cool Drawer slides will require removing the water tank cover and the Quick Chill mullion (see the **Quick Chill Mullion** section under **Climate Control Drawer** in this service guide).

Water Tank

The water tank on dispenser models is located behind the vegetable drawer. The tank is a wrap of 5/16 in. tubing that connects to the freezer door connection at the bottom of the refrigerator and the dispenser valve in the machine compartment. The tubing that connects to the water valve runs up the channel on the backside of the refrigerator, alongside the wiring harnesses which is covered by a thin access panel.

Water Tank Removal

1. Remove drawers (see **Drawer Removal**, in the **Drawers (Pans)** section of this service guide).
2. Remove wire drawer frames (see **Wire Drawer Frame Removal**, in the **Drawers (Pans)** section of this service guide).
3. Push down gently on the back center of the climate control drawer top surface to release the bottom of the water tank cover. Pull out and down to remove the water tank cover.
4. Remove Lighted Vegetable Shelf.
5. Remove Quick Chill Mullion (see the **Quick Chill Mullion** section under **Climate Control Drawer** in this service guide).
6. Remove the two Philips head screws securing the tank to the cabinet.



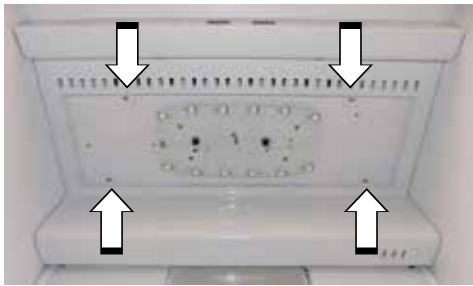
7. Remove the toe kick.
8. Disconnect the water line from the door connector.
9. Disconnect the water line from the dispenser valve.

HMI (Temperature Control Board)

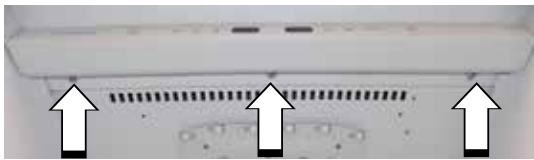
The HMI is located at the top of the fresh food section. Through the HMI, the consumer is able to change freezer and fresh food temperature settings, reset the water filter, turn on Wi-Fi connectivity, and set the door alarm (some models). Technicians can enter service mode and check for fault codes (see the **Diagnostic Mode** section in this service guide for more information). The HMI is an assembly that consists of a display board, touch pad, and housing.

HMI Removal

1. Remove the upper LED shield.
2. Remove the four Philips head screws and lower the LED housing.



3. Remove the three Philips head screws securing the HMI to the ceiling.



4. Slide the HMI forward to release four tabs inside the HMI housing then lower the assembly.
5. Disconnect the three pin connector.

HMI Diagnosing

Voltage for the HMI can be checked at the three pin connector inside the assembly. Should no display on the refrigerator work, start voltage checks at the J4 connector of the main board.

Main Board:

- J4 pin 2 (**brown**) to J4 pin 3 (**orange**) = 13 VDC
- J4 pin 2 (**brown**) to J4 pin 4 (**violet**) = 13 VDC

HMI 3 pin connector:

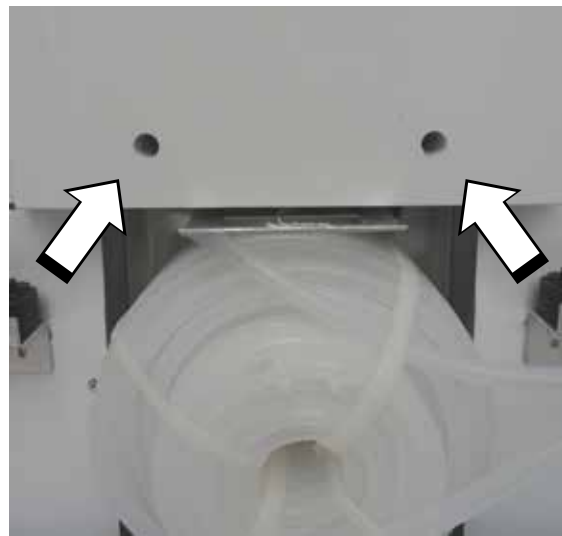
- **Brown** to **Orange** = 13 VDC
- **Brown** to **Red** = 13 VDC

Damper

Airflow enters the fresh food compartment through an electronic damper. The damper is located at the top of the fresh food compartment behind the light housing. The damper motor is part of the upper duct and can only be replaced as an assembly.

Damper Removal

1. Remove all shelves and the two upper drawers (pans).
2. Remove the upper light shield and housing.
3. Remove the water tank cover.
4. Remove the two Philips head screws from the bottom of the air tower.



5. With a flat blade screwdriver, push in the four tabs on the side of the air tower (two on each side) and pull the air tower cover forward.



6. Pull the foam block to the right of the damper assembly out and peel the tape off the top of the air tower duct.

NOTE: The tape will need to be either reinstalled during reassembly or replaced with a new piece of tape.



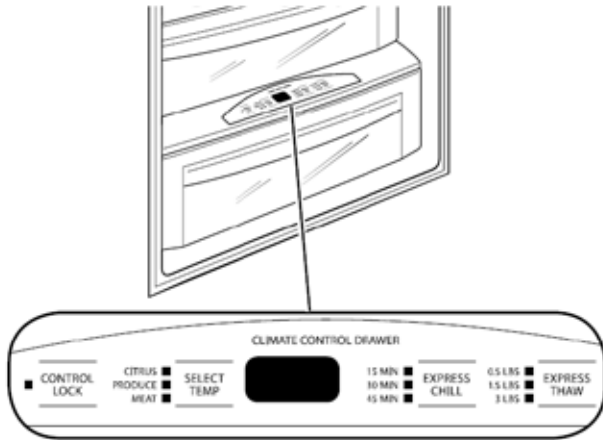
7. Remove the air tower duct.
8. Disconnect the six pin damper connector.
9. Slide the damper assembly to the right to remove the assembly.

NOTE: The assembly may be very snug in the upper air passage. Wiggling the assembly gently while sliding it to the right will help to remove the assembly.

Damper Diagnosing

The damper motor has an approximate resistance of 415 ohms from the **blue** to **white** wires and from the **red** to **yellow** wires. Operate the damper from service mode (see the **Diagnostic Mode** section in this service guide) to test functionality.

Climate Control Drawer



The Climate Control feature is a system of a damper, a fan, and a temperature thermistor. The Climate Control drawer can be used to store items at their optimum temperatures (Select Temp), chill items (Express Chill), or thaw foods quickly (Express Thaw). The drawer is tightly sealed to prevent the drawer's temperature from causing temperature fluctuations in the rest of the refrigerator.

Select Temp

This feature has three settings (each setting will maintain a specific temperature range for the drawer).

- **Citrus setting:** 39°F - 47°F
- **Produce setting:** 31°F - 38°F
- **Meat setting:** 27°F - 37°F

Express Chill

This feature can be used to cool items in the drawer in minutes, rather than hours. Express chill can be selected for 15, 30, or 45 minutes. Freezer air is circulated into the drawer through the climate control drawer damper. Once the cycle is completed, the drawer will revert to the **OFF** mode.

Express Thaw

This feature thaws items in hours rather than days. Food is gently thawed in a cool environment by circulating air throughout the drawer. Express Thaw can be selected for .5, 1.5, or 3 lbs. Temperature is maintained in the drawer by cycling a small heater off and on as needed. Once the thaw cycle is complete, the pan will automatically adjust to a temperature of 27°F - 37°F to store the food at its optimum temperature.

NOTE: When the controls on the Climate Control Drawer are turned off, the drawer will maintain temperatures of 42°F - 48°F.

Control Lock

Pressing and holding the Control Lock for three seconds will lock the settings for the Climate Control Drawer. To unlock the drawer, press and hold the pad for another three seconds.

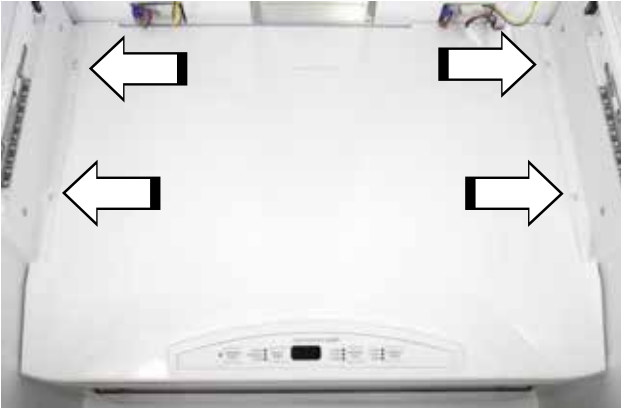


Quick Chill Mullion

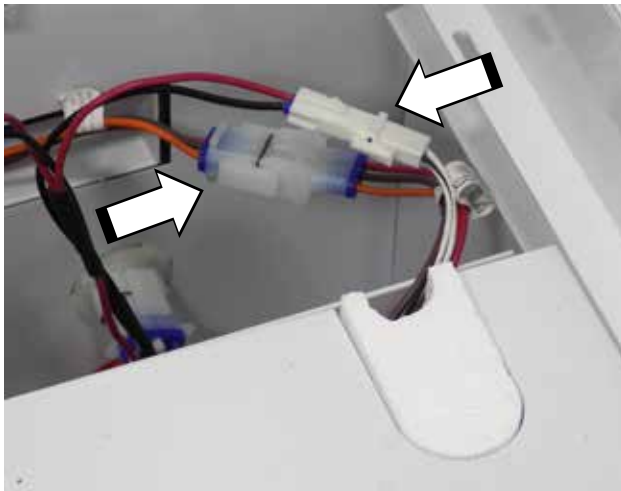
The quick chill mullion assembly is the insulated divider between the custom cool drawer and the vegetable drawer. The assembly consists of the mullion, climate control interface (display), and LED lighting for the climate control drawer.

Quick Chill Mullion Removal

1. Remove drawers (see **Drawer Removal**, in the **Drawers (Pans)** section of this service guide).
2. Remove the drawer frames (see **Wire Drawer Frame Removal**, in the **Drawers (Pans)** section of this service guide).
3. Remove the shelf above the vegetable drawer.
4. Remove the water tank cover.
5. Remove the four Philips head screws.



6. Slide the Mullion forward.
7. Disconnect the DC wiring connections.



Quick Chill Mullion Diagnosing

Voltage for the Quick Chill mullion can be checked at the three pin connector behind the mullion. Should no display on the refrigerator work, start voltage checks at the J4 connector of the main board.

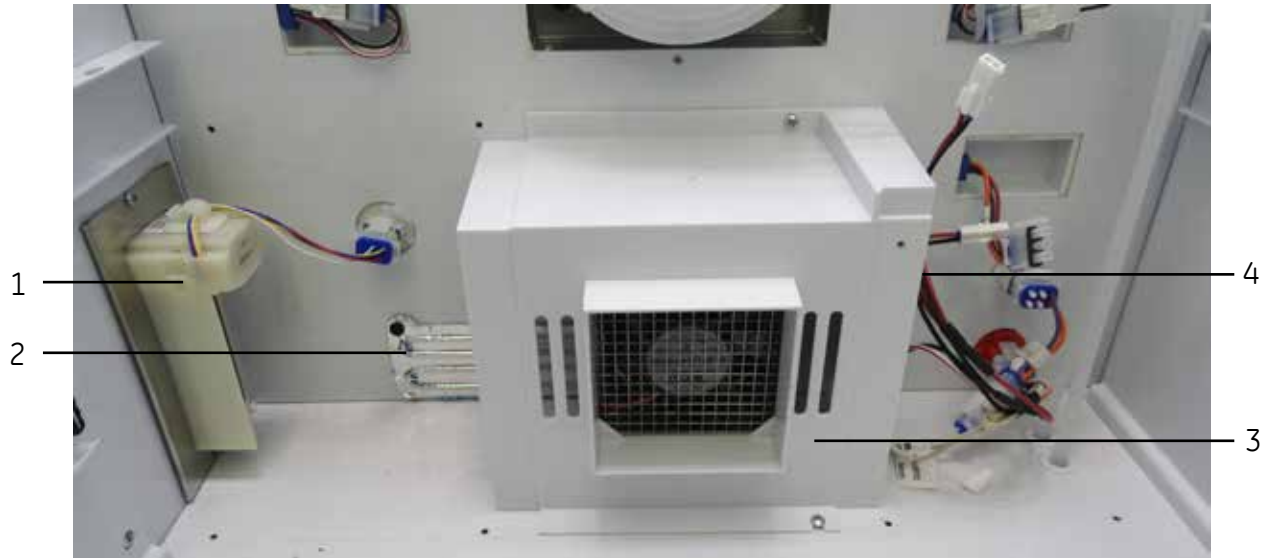
Main Board:

- J4 pin 2 (**brown**) to J4 pin 3 (**orange**) = 13 VDC
- J4 pin 2 (**brown**) to J4 pin 4 (**violet**) = 13 VDC

Quick Chill 3 pin connector:

- **Brown** to **Orange** = 13 VDC
- **Brown** to **Red** = 13 VDC

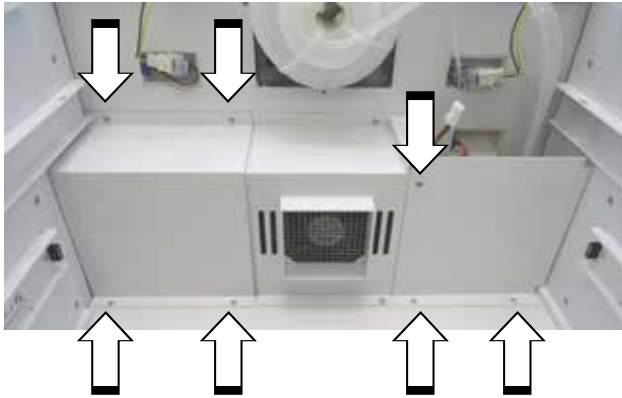
Quick Chill Component Locator



- | | |
|-----------------------|---|
| 1. Damper | 3. Fan assembly |
| 2. Quick Chill heater | 4. Thermistor (mounted to the right side of the fan assembly) |

Accessing Quick Chill Components

1. Remove drawers (see **Drawer Removal**, in the **Drawers (Pans)** section of this service guide).
2. Remove drawer frames (see **Wire Drawer Frame Removal**, in the **Drawers (Pans)** section of this service guide).
3. Remove the shelf above the vegetable drawer.
4. Remove the water tank cover.
5. Remove the Quick Chill mullion (see the **Quick Chill Mullion** section under **Climate Control Drawer** in this service guide).
6. Remove the seven Philips head screws to remove the left and right covers.



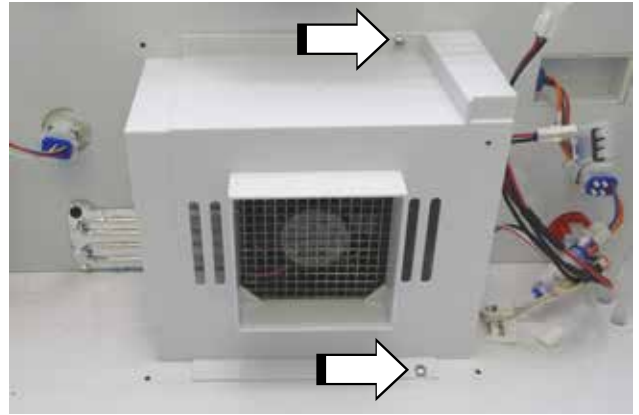
Quick Chill Fan

The quick chill fan circulates air for the custom cool drawer. The fan and fan housing come as an assembly. To operate the fan, the main board supplies 13 VDC depending of the setting of the Climate Control Drawer and the temperature of the Quick Chill thermistor.

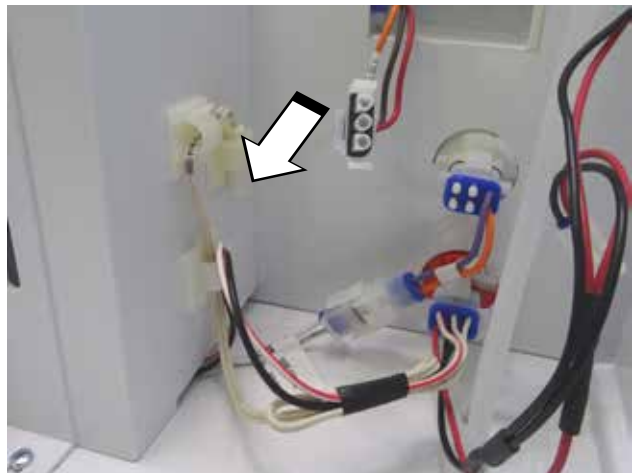
Quick Chill Fan Removal

1. Follow the steps in **Accessing Quick Chill Components**.

2. Remove two Philips head screws.

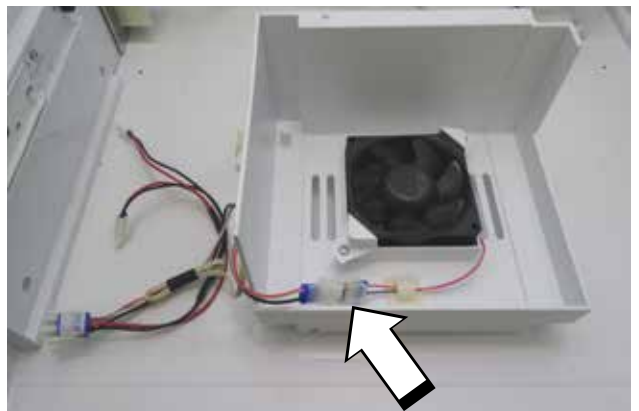


3. Unclip the Quick Chill thermistor.



4. Pull the fan housing forward.

5. Locate the fan harness on the backside of the fan housing and disconnect the connector.



Quick Chill Fan Diagnosing

Voltage checks for the quick chill fan can be made at the main board or the two pin fan connector.

Main Board:

- J2 pin 8 (red) to J2 pin 7 (black) = 13 VDC

Quick Chill Damper

The Quick Chill damper allows the quick chill fan to pull freezer air into the climate control drawer for Select Temp and Express Chill settings.

Quick Chill Damper Removal

1. Follow the steps in **Accessing Quick Chill Components**.
2. Disconnect the damper's six pin connector.
3. Remove the two Philips head screws.



Quick Chill Damper Diagnosing

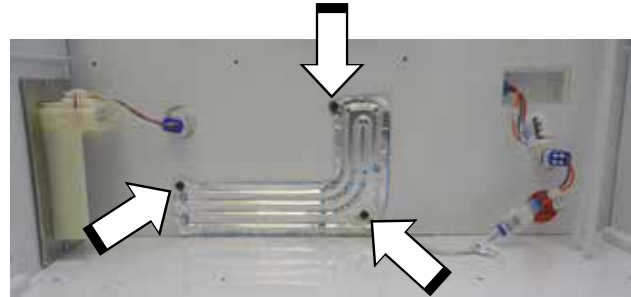
The damper motor has an approximate resistance of 415 ohms from the **blue** to **white** wires and from the **red** to **yellow** wires. Operate the damper from service mode (see the **Diagnostic Mode** section in this service guide) to test functionality.

Quick Chill Heater

The Quick Chill heater is utilized for the Express Thaw feature of the Custom Cool Drawer. The 120 VAC heater is cycled on and off by the main board.

Quick Chill Heater Removal

1. Follow the steps in **Accessing Quick Chill Components**.
2. Remove the Quick Chill fan assembly.
3. Disconnect the heater connector.
4. Remove the three push buttons.



5. Peel the adhesive backed heater off the fresh food liner.

Quick Chill Heater Diagnosing

The 120 VAC heater has a resistance value of 441 ohms. Resistance or voltage check can be performed at the main board or the heater's connector behind the Quick Chill components.

Main Board:

- J7 pin 5 (**violet**) to J7 pin 7 (**orange**)

Freezer

Freezer Interior Component Locator



May not be on all models.

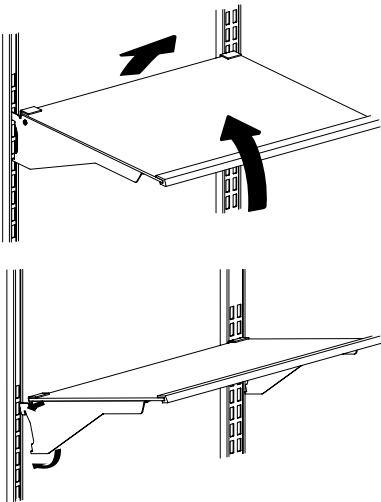
Shelves and Baskets

Adjustable Shelves

Wire shelves in the freezer compartment enable efficient shelf arrangements that fit food storage needs.

To remove shelves: Tilt the shelf up at the front, then lift it up and out of the tracks on the rear wall of the refrigerator.

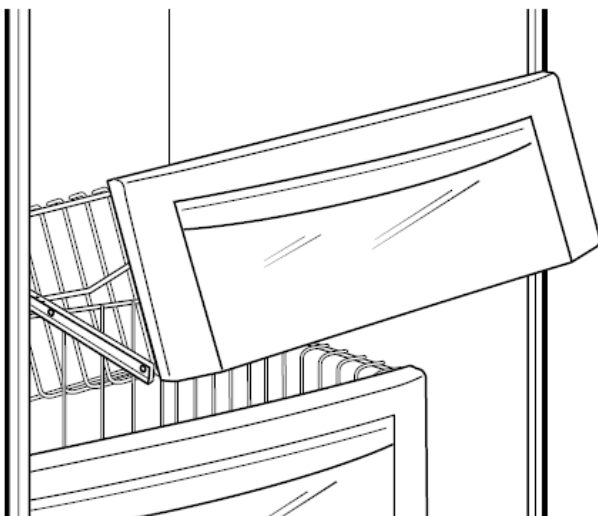
To replace shelves: Select the desired shelf height. With shelf front raised slightly, engage the top lugs in the tracks at the rear of cabinet. Then lower the front of the shelf until it locks into position.



Baskets

Wire slide-out freezer baskets can be pulled out for easy access to frozen foods.

To remove baskets: Pull the basket out. Lift the front of the basket up and take it out.

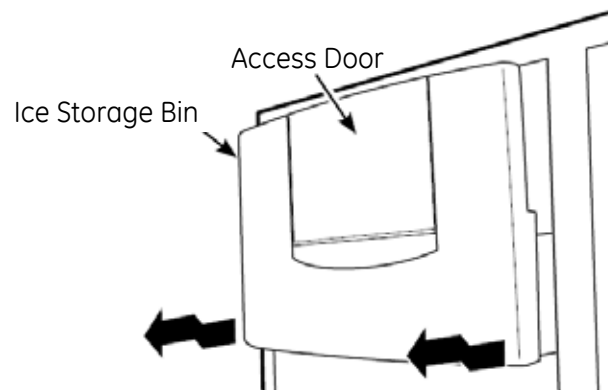


Ice Storage Bin

The ice storage bin (bucket) has an access door to allow for removal of ice from the bin without removing the bin. On dispensing models, the bucket will have an auger to drive the ice out of the bucket and blades to crush ice. The ice bucket is set up to crush ice unless the crushed/cubed solenoid releases the ice deflector (see the **Freezer, Crushed/Cubed Solenoid** section in this service guide for more information).

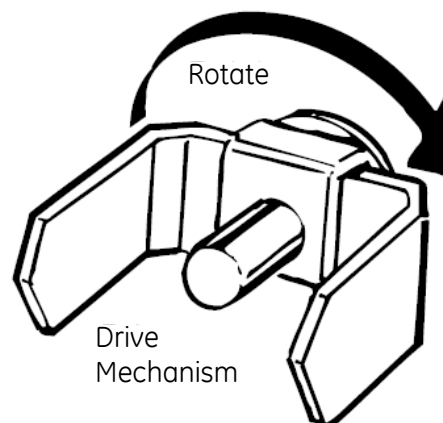
Bin Removal

Lift up the access to reach the icemaker. Set the icemaker power switch to the **OFF** position. With the access door closed, support the storage bin at the bottom while slightly lifting. Pull the bin straight out.

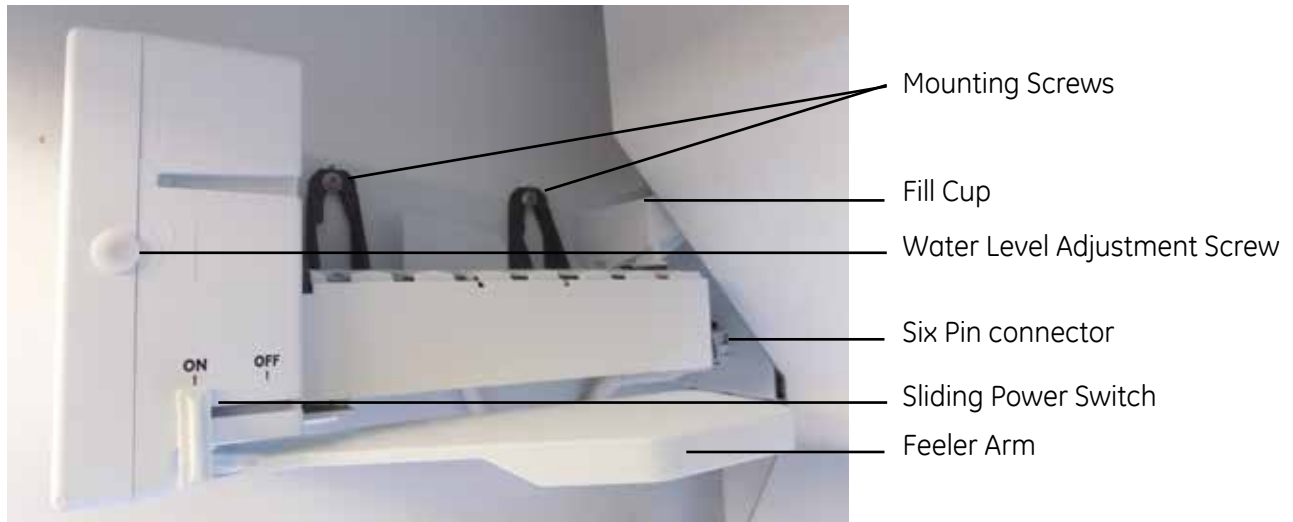


Bin Replacement

Slide the bin back until the tabs on the underside of the bin lock into the slots on the bucket slides. If the bin does not go all the way back, remove it and rotate the drive mechanism 1/4 turn. Then push the bin back again.



Icemaker



A newly-installed refrigerator may take 12 to 24 hours to begin making ice. The icemaker will produce seven cubes per cycle; approximately 15 cycles in a 24 hour period.

If the refrigerator is operated before the water connection is made to the icemaker, set the power switch to **OFF**.

When the refrigerator has been connected to the water supply, set the power switch to **ON**.

Throw away the first full bucket of ice to allow the water line to clear.

Be sure nothing interferes with the sweep of the feeler arm. When the bin fills to the level of the feeler arm, the icemaker will stop producing ice.

It is normal for several cubes to be joined together. If ice is not used frequently, old ice cubes will become cloudy, taste stale and shrink.

If ice cubes get stuck in the icemaker, set the power switch to **OFF** and remove the cubes. Set the power switch to **ON** to restart the icemaker.

After the icemaker has been turned on again, there will be a delay of about 45 minutes before the icemaker resumes operations.

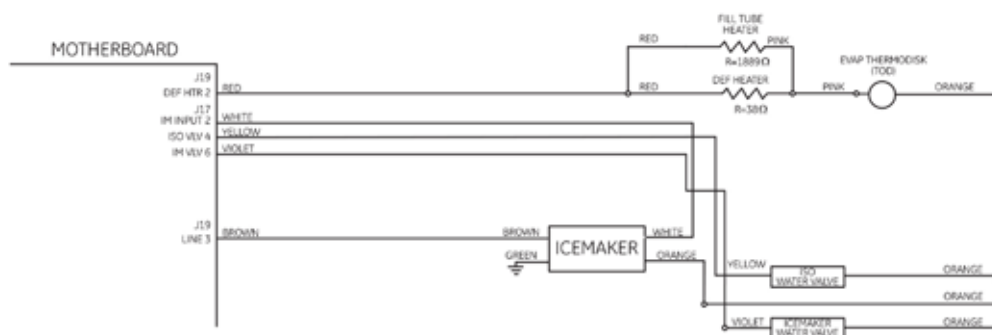
NOTE: The icemaker works best when supply water pressure is between 40 and 120 PSI in the home.

⚠ CAUTION Avoid contact with the moving parts of the ejector mechanism, or with the heating element (located on the bottom of the icemaker) that releases the cubes. Do not place fingers or hands on the automatic ice making mechanism while the refrigerator is plugged in.

Even though the same standard electromechanical icemaker is used (as on many other models), the main board supplies voltage to isolation and icemaker valves when the icemaker calls for water.

- 120 VAC is supplied to the isolation valve from J17 pin 4 (**yellow**).
- 120 VAC is supplied to the icemaker valve from J17 pin 6 (**violet**).
- 120 VAC is **not** supplied to the valves from J17 if:
 - Freezer temperature is greater than 20°F
 - Fresh Food temperature is greater than 50°F

The icemaker's water fill is controlled by the main board K3 relay by supplying 120 VAC to the isolation and icemaker valves from connector J17 pins 4 (**yellow**) and 6 (**violet**).



If the defrost heater is on, the Fill Tube Heater relay will be on.

After the Fill Tube Heater is on during defrost, the water valve relay will not be energized. The water valve will require input from the icemaker to energize the K3 relay.

The icemaker relay will turn on IM off time after trying to fill (0 to 255 minutes) after the main board receives input from the icemaker.

Upon the completion of 20 seconds of continuous input from the icemaker to the K3 relay, the K3 relay will turn off.

After receiving input from the icemaker, the main board will turn the fill tube heater relay on during the IM off time after trying to fill (0 to 255 seconds). The fall back time is 60 seconds.

When the fill tube heating cycle completes, the icemaker water valve will turn on for 5.2 seconds to fill the icemaker with water.

The water valve can only come on after the input from the icemaker and the Fill Tube Heater On Time has expired.

Icemaker Diagnosing

If the icemaker has dry filled it will take approximately 20 minutes for the icemaker to cycle again before voltage can be checked at J17 pin 4 (yellow) and pin 6 (violet). However, this time can be bypassed by manually cycling the icemaker. To manually cycle the icemaker pull the rake arm up and to the right until it begins moving on its own.

Icemaker Removal

Remove the ice storage bin (bucket) to access the icemaker. The icemaker is removed by loosening the two Phillips screws just above the mold. Disconnect the 6 pin electrical connector, then lift up and out on the assembly.

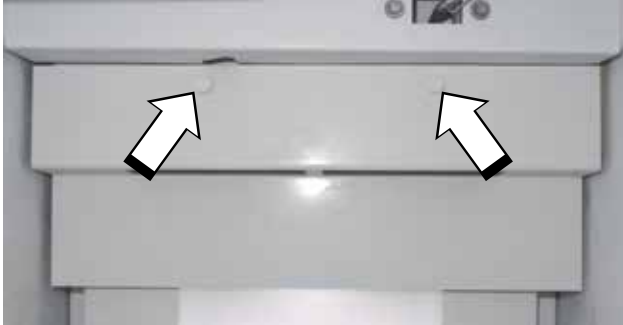


Auger Motor

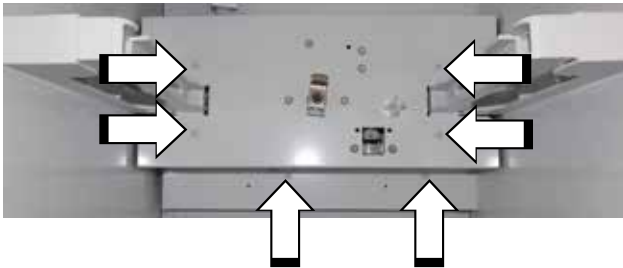
The auger motor is a 120 VAC motor which turns counter-clockwise to turn the auger in the ice storage bin (bucket).

Auger Motor Removal

1. Remove the ice storage bin.
2. Disconnect the icemaker connector.
3. Remove the two thumb screws to remove the trim panel under the auger motor housing.



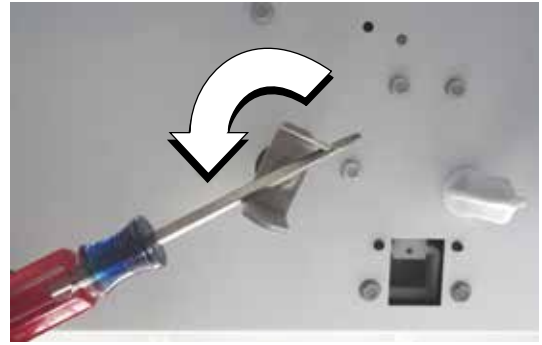
4. Remove the six Philips head screws.



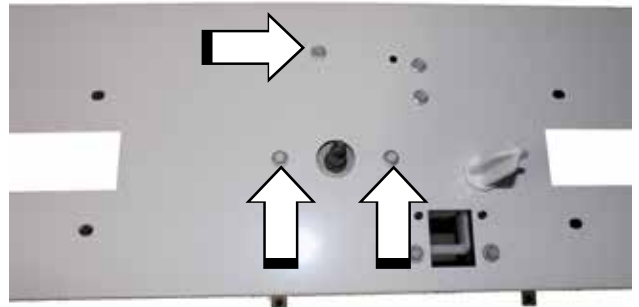
5. Pull the auger housing forward and disconnect the six pin connector.



6. Remove the fork by applying a quick counter-clockwise force with a screwdriver in between the prongs of the fork.



7. Remove the three 1/4 in. screws.



8. Disconnect the two pin connector for the auger motor harness.

Auger Motor Diagnosing

The auger motor receives 120 VAC from the main control board and has a resistance value of 2 ohms. When checking for voltage to the auger motor, ensure that the Freezer Door Switch 2 is engaged and the paddle switch is pressed. No voltage should be read from J7 pin 7 to J7 pin 9. If 120 VAC is present, the switch is not fully engaged or the door switch is faulty.

Main Board:

- J7 pin 1 (**black**) to J7 pin 9 (**orange**) = 120 VAC

Crushed/Cubed Solenoid

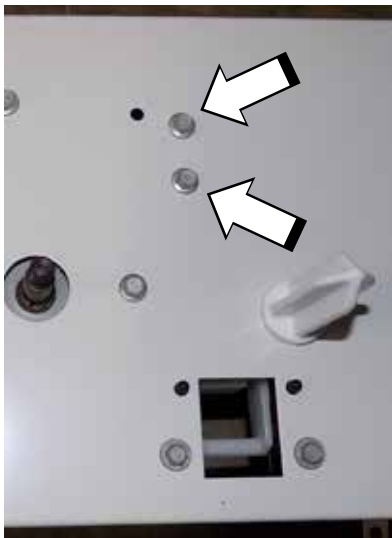
To dispense cubed ice, the deflector in the ice bucket will need to be disengaged. The main board delivers voltage to the crushed/cubed solenoid to pull up on the arm on the backside of the ice bucket, which lowers the deflector and allows the cubes to miss the stationary crusher blades.

Solenoid Removal

1. Follow steps 1 - 5 of **Auger Motor Removal**.
2. Remove the **orange** and **purple** wires from the solenoid.



3. Remove the two 1/4 in. screws to remove the solenoid.



Solenoid Diagnosing

If only crushed ice is dispensed, check that the arm of the ice bucket is not under the crushed/cube solenoid's stirrup, and that the plunger moves up and down in the solenoid freely. The solenoid will receive 120 VAC from the main board, and has a resistance of 39 ohms. When checking for voltage to the solenoid, ensure that the Freezer Door Switch 2 is engaged, and that the paddle switch is pressed.

No voltage should be read from the J7 pin 7 to J7 pin 9. If 120 VAC is present, the switch is not fully engaged or the door switch is faulty.

Main Board:

- J7 pin 2 (**violet**) to J7 pin 9 (**orange**) = 120 VAC

Fill Tube Heater

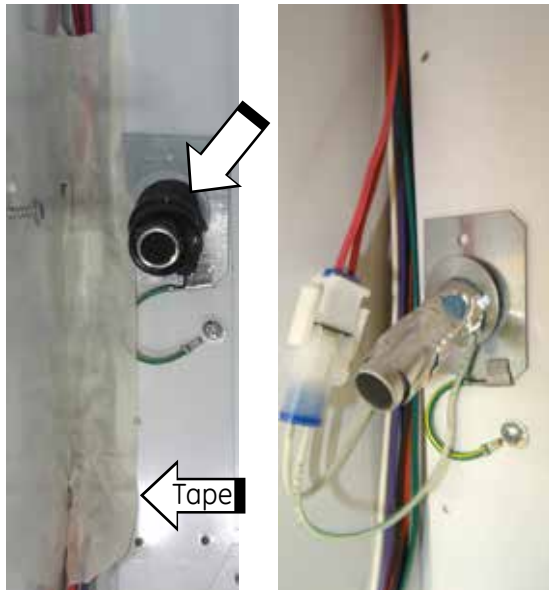
Wrapped around the icemaker fill tube is the fill tube heater. The heater is in parallel with the defrost heater. During defrost, the voltage supplied by the mainboard for the defrost heater is also supplying the fill tube heater with 120 VAC. The heater and fill tube will come as an assembly, should either need to be replaced.

Fill Tube Heater Removal

1. Follow steps 1 - 5 of **Auger Motor Removal**.
2. Remove the icemaker (see the **Freezer, Icemaker Removal** section in this service guide).
3. Remove the four Philips head screws securing the fill tube cover.



4. Peel back masking tape (if present) to reveal the heater connector. The tape is used to keep the wiring in the channel to the left of the fill tube, and prevent pinched wiring). Remove the plastic sleeve.



5. Disconnect the connector.
6. Pull the fill tube from the cabinet.

Fill Tube Heater Diagnosing

The fill tube heater has a resistance of 1,889 ohms. To test the heater, operate the heater through service mode test 0 60 (see the **Diagnostic Mode** section in this service guide for more information). Check for 120 VAC at the two pin connector (**red** and **pink** wires). If 120 VAC cannot be read at the **red** and **pink** wires, make sure the evaporator thermodisc (TCO) is closed. When open, the TCO will drop the neutral to the fill tube heater.

Freezer Fan

The freezer fan is a permanent magnet 4-pole, DC motor that operates at three different speeds: high, medium, and low. The speed of the fan is controlled by the voltage output from the main control board. Voltage output from the control board to the fan is 13.6 VDC; however to regulate the speed of the fan, the main control board uses **Pulse Width Modulation (PWM)**. When operating, voltage is sent in pulses (much like a duty cycle) as opposed to an uninterrupted flow. This pulsing of 13.6 VDC produces an effective voltage reduction. The main control board selects and regulates fan speed and varies the length and frequency of the 13.6 VDC pulse. The main control board monitors the speed of the motor and adjusts the PWM.

The freezer fan uses four wire connections:

- **White Wire (DC Common)**

The white wire is the DC common wire used for testing. During repairs, DC polarity must be observed. Reversing the DC polarity will cause a shorted motor and/or board.

- **Red Wire (Supply)**

Each motor uses an internal electronic controller to operate the motor. Supply voltage from the main control board remains at a constant 13.6 VDC.

- **Blue Wire (Feedback/RPM)**

The blue wire feeds RPM (speed) information to the main control board, allowing the board to maintain consistent fan speeds. Loss of feedback from the blue wire will result in the fan accelerating to maximum speed. Measure the fan RPM using the frequency between the blue and white wires.

- **FZ Fan Low:** 2,400 RPM = 160 Hz
- **FZ Fan Med:** 2,600 RPM = 180 Hz
- **FZ Fan High:** 3,100 RPM = 208 Hz

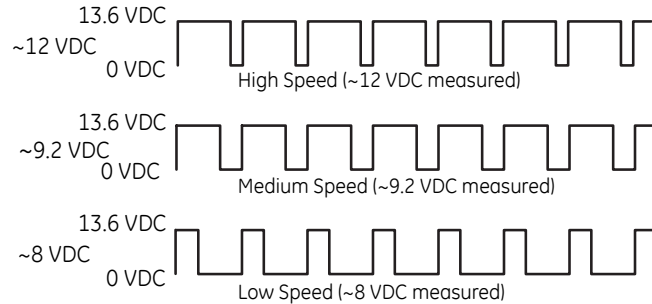
- **Yellow Wire (Signal)**

The yellow wire is the input wire from the main control board to control the operating speed.

Freezer Fan Diagnosing

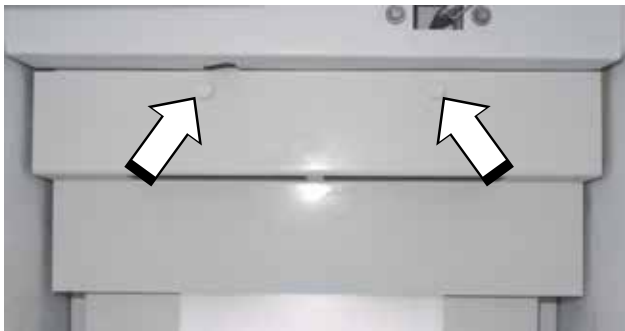
Checking from the main board approximate operating voltages can be read at the J2 connector.

- J2 pin 8 (**red**) - J2 pin 3 (**white**) = ~12 VDC
- J2 pin 5 (**yellow**) - J2 pin 3 (**white**) = 4 - 12 VDC (depending on fan speed)



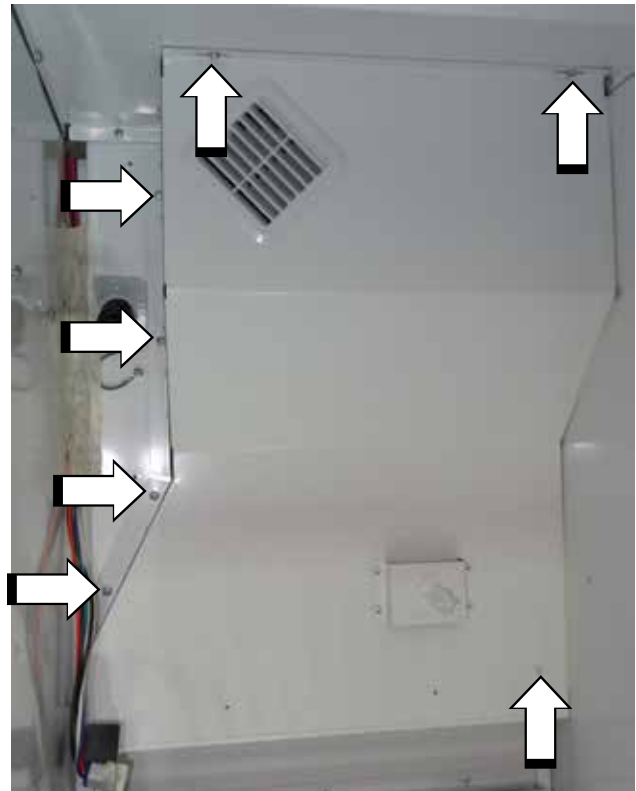
Freezer Fan Removal

1. Remove the ice bucket.
2. Remove the icemaker.
3. Remove the ice bucket supports (two Philips head screws for each bracket).
4. Remove the two thumb screws to remove the cover.



5. Remove the auger motor housing (on select models).
6. Remove the fill tube cover (see **Fill Tube Heater Removal** in this section).

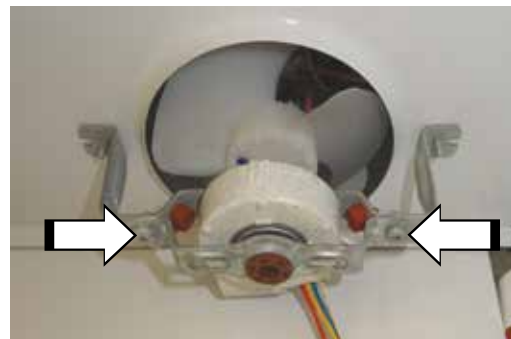
7. Remove the seven Philips head screws to remove the rear cover.



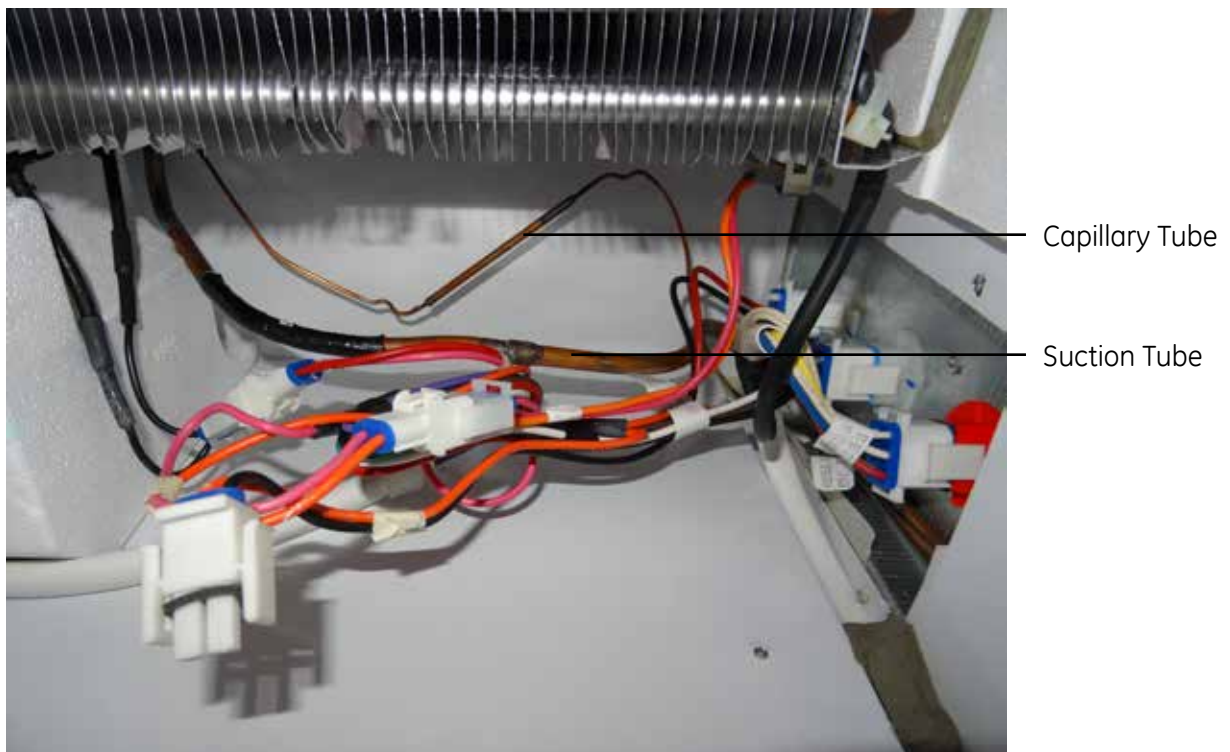
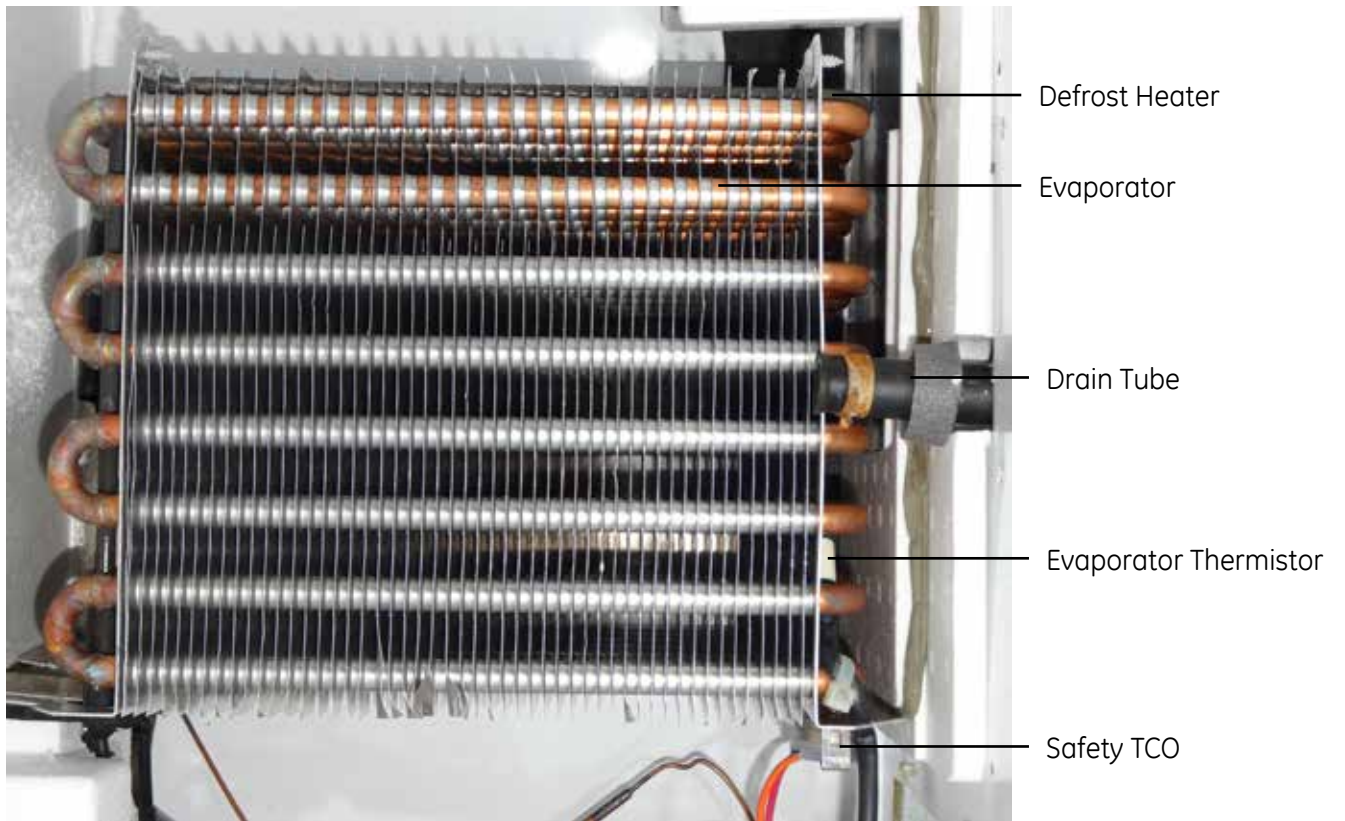
8. Disconnect one Philips head screw securing the fan harness to the cabinet, and disconnect the connector.



9. Remove the two Philips head screws from the fan bracket. Make note of the fan blade orientation, and pull down on the fan motor. Pulling down on the fan motor will force the blade off of the motor shaft.



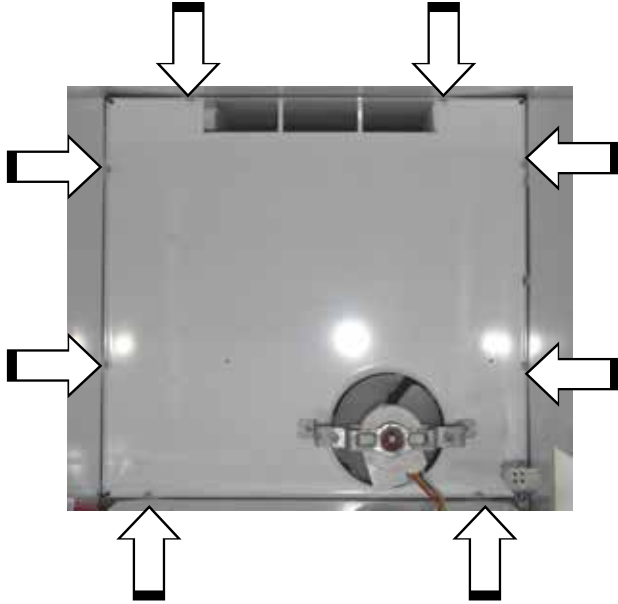
Evaporator Component Locator



Accessing Evaporator Components

To access the evaporator components:

1. Follow steps 1 - 8 of **Freezer Fan Removal**.
2. Remove the eight Philips head screws and remove the evaporator cover (the freezer fan can be left attached to the cover).



3. Follow steps 1 - 6 of **Drain Pan Assembly Removal**.

Drain Pan Assembly

The drain pan assembly consists of a trough, heater, and foam block. The trough collects the defrost water and directs it through the drain tube. A 120 VAC heater is adhered to the underside of the trough and sandwiched between the trough and foam block. The heater prevents the defrost water from freezing in the trough and blocking the drain hole. Replacing the heater requires replacing the drain pan assembly.

The main board will turn on the drain pan heater after pre-chill for a pre-determined time (EEPROM parameter programmed into the main board) prior to turning on the defrost heater. The drain pan heater will remain on throughout defrost and dwell cycles (see the **Defrost Operation** section for more information on pre-chill, defrost, and dwell cycles).

Drain Pan Assembly Removal

1. Follow steps 1 - 8 of **Freezer Fan Removal**.
2. Remove the evaporator cover.
3. Disconnect the drain pan heater wire connector.

4. Remove the Philips head screw securing the ground wire of the drain pan heater to the cabinet.



5. Lower the left side of the drain pan assembly and pull the assembly to the left.
6. Using a pair of pliers, squeeze the hose clamp to release the pan assembly from the drain tube.



NOTE: When reinstalling the drain pan assembly, it is important to make sure the assembly is level. An unlevelled assembly could allow water from the defrost cycles to flow over the edge of the drain pan, causing water to leak in the freezer or freeze around the fan, which would create a noisy fan or a no-cool situation.

Drain Pan Heater Diagnosing

The drain pan heater can be checked at the J12 and J7 connectors on the main board.

- J12 (**black**) - J7 pin 9 (**orange**)

NOTE: The safety thermostat is in a series circuit with the drain pan heater. If the heater circuit checks open from the main board it will be necessary to check at the heater wiring connector to determine if the heater or safety TCO is open. The pan heater has a resistance of 330 ohms.

Defrost Heater

The defrost heater is a ceramic heater which has a resistance of 38 ohms and will receive 120 VAC from the main board during defrost.

Defrost Heater Diagnosing

- J19 pin 2 (red) - J7 pin 9 (orange)

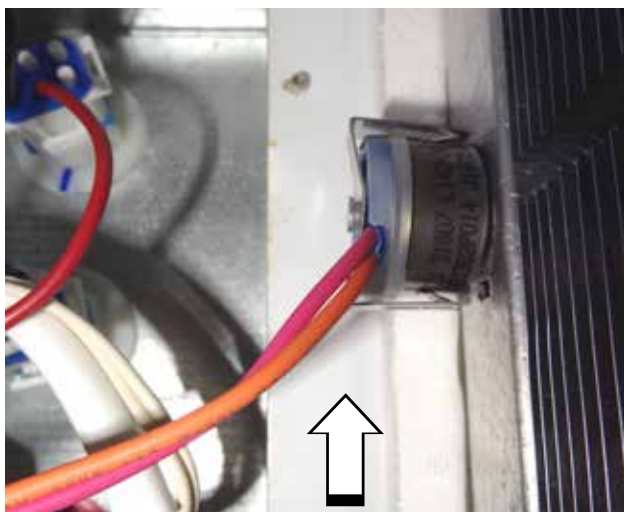
NOTE: The safety thermostat is in a series circuit with the defrost heater. If the heater circuit checks open from the main board, it will be necessary to check at the heater wiring connector to determine if the heater or safety TCO is open.

Safety Thermostat

The safety thermostat (TCO) is a thermodisc (bimetal switch) designed to ensure the defrost cycle doesn't go into a run-away state. The TCO is in line with the defrost heater and will open when it reaches a temperature of 140°F and close when the evaporator temperature lowers to 110°F.

Safety Thermostat Removal

The TCO is clipped to the backside of the evaporator. To remove the TCO, push up on the underside of the TCO clip and tip the TCO up to release the clip. Disconnect the connector.



Safety Thermostat Diagnosing

The safety thermostat can be checked at the J19 and J7 connectors on the main board.

- J19 pin 2 (red) - J7 pin 9 (orange)

NOTE: The safety thermostat is in a series circuit with the defrost heater. If the heater circuit checks open from the main board, it will be necessary to check at the safety TCO wiring connector to determine if the heater or safety TCO is open.

Evaporator

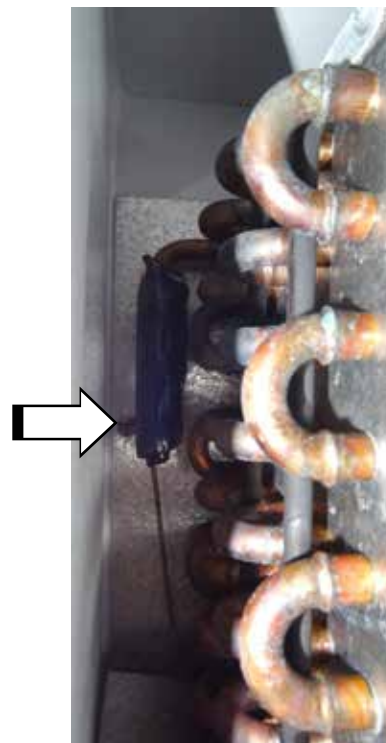
Located above the evaporator fan, the evaporator is made up of copper and aluminum. Heat energy is pulled into the refrigerant through the evaporator coils, to later be dispersed by the condenser coils.

Evaporator Removal

1. Recover the refrigerant.
2. Follow steps for **Drain Pan Assembly Removal**.
3. Disconnect the safety thermostat.
4. Remove the evaporator thermistor from the evaporator coil.
5. Disconnect the defrost heater connector.

Caution: If brazing, protect the wiring from heat during de-soldering and re-soldering.

6. De-solder the capillary tube (if brazing), or score and cut the tube closest to the evaporator connection (if using LokRing).
7. De-solder the suction line (if brazing) or cut the tubing closest to the evaporator connection (if using LokRing).
8. Remove the one Phillips head screw to the left of the evaporator to lower the coils.



Important: The filter dryer should be replaced when any sealed system repair is performed. Refer to the mini manual or the model/serial tag for the exact refrigerant type and charge quantity.

Defrost Operation

Adaptive Defrost

Adaptive Defrost is a defrost system that adjusts to a refrigerator's surrounding environment and household usage. Unlike conventional defrost systems that use electromechanical timers with a fixed defrost cycle time, Adaptive Defrost utilizes electronic controls to determine when the defrost cycle is necessary. In order to accomplish the optimum defrost cycle time, the main control board monitors the following refrigerator operations:

- Length of time the refrigerator doors were open since the last defrost cycle
- Length of time the compressor has run since the last defrost cycle
- Amount of time the defrost heaters were on in the last defrost cycle

Adaptive Defrost is divided into 5 separate cycles. Those operations are:

- Cooling Operation
- Pre-Chill Operation
- Defrost Heater Operation
- Dwell Period
- Post Dwell

Adaptive Defrost (Cooling Operation)

During the cooling operation, the main control board monitors both fresh food door openings, freezer drawer openings and compressor run times. The board counts the time that the doors are open, and reduces the length of time between defrosts by 1,260 seconds (multiplication factor) for each second that door is open. If the freezer drawer and fresh food door(s) are open at same time, the time is doubled. One or both fresh food doors are counted as one. The door open times with the multiplication factor reduces compressor run time by that amount. If the doors are not opened, the compressor will run up to 96 hours between defrosts. If the doors are opened frequently and/or for long periods of time, the compressor run time between defrosts will be reduced to as little as 9 hours.

Example: If between defrosts the fresh food was open for a total of 2 minutes and the freezer was open for a total of 1 minute, the compressor run time between defrosts would be reduced by 63 hours.

Adaptive Defrost (Pre-Chill Operation)

When the main control board determines that defrost is necessary, it will force the refrigerator into a continuous cool mode called pre-chill. During pre-chill, the freezer temperature may be driven below the set point. However, the fresh food temperature will be regulated by the evaporator fan running at low speed. Pre-chill will last up to 60 minutes. These models do have an 8 hour defrost hold-off.

Defrost hold-off occurs if a door is opened during pre-chill. This will reset the pre-chill time back to 60 minutes. After 8 hours of pre-chill, the defrost heater will be activated even if the doors are opened.

Defrost Heater Operation

After the operation, the main control board turns off the compressor, condenser fan, and evaporator fan. During defrost operation, the main control board monitors the evaporator temperature using evaporator thermistor inputs. Typically, the evaporator thermistor will sense a temperature of 45°F within approximately 16 minutes. When the thermistor senses 45°F, the main control board will terminate the defrost heater operation. The maximum defrost cycle (heater on) time is 35 minutes (main control board time out). The defrost system is protected by a safety over-temperature thermodisc (bimetal switch). The thermostat opens when the evaporator temperature rises to 140°F and closes when the evaporator temperature lowers to 110°F.

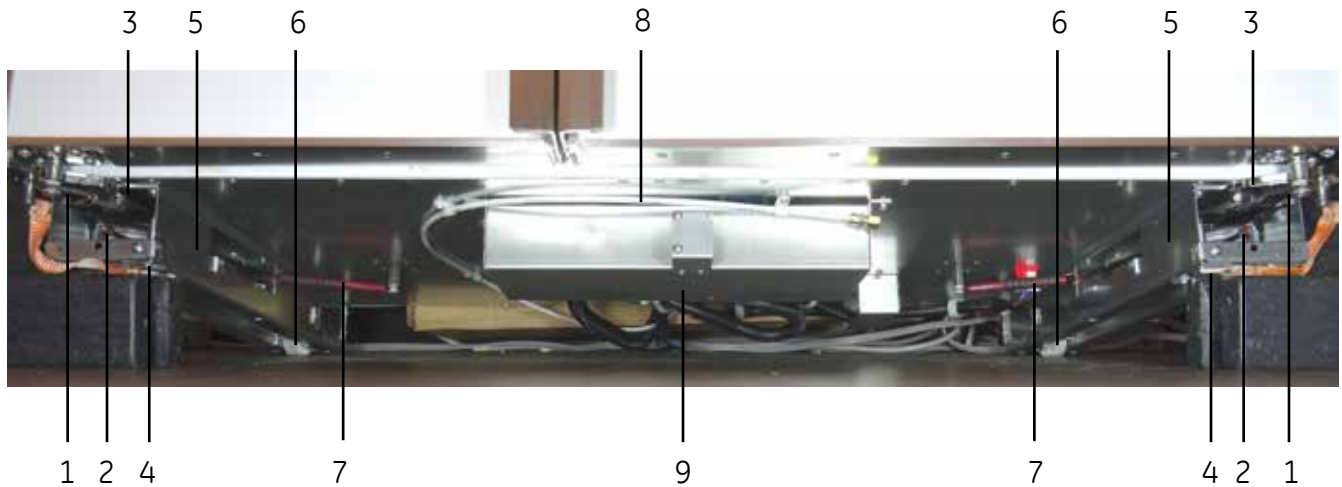
Dwell Period

After the defrost heater operation has been terminated by the main control board, a 10 minute dwell period occurs. During this period, the compressor, condenser fan, and evaporator fan remain off. The remaining frost melting from the evaporator will continue to drip and drain so that, prior to the cooling operation, the evaporator will be totally clear of any moisture.

At the end the dwell period, the compressor and fans are restarted and the cooling cycle begins again.

Cabinet Bottom

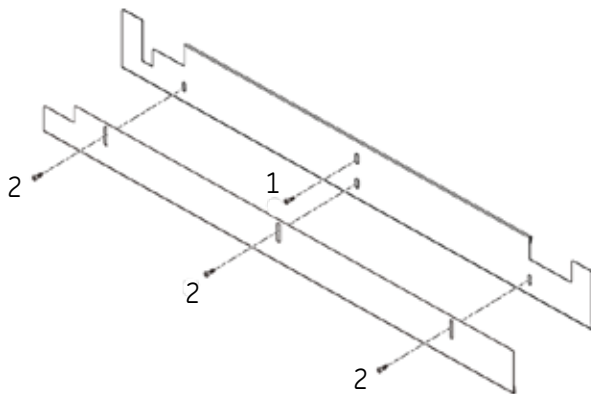
Cabinet Bottom Component Locator - Front



- | | |
|---------------------------|----------------------------|
| 1. Door Closure Arm | 7. Door Closure Spring |
| 2. Rear Roller Adjustment | 8. Water Filter Inlet Tube |
| 3. Lower Hinge | 9. Transformer Cover |
| 4. Front Leveling Leg | |
| 5. Base Channel | |
| 6. Rear Roller | |

Toe Kick Installation

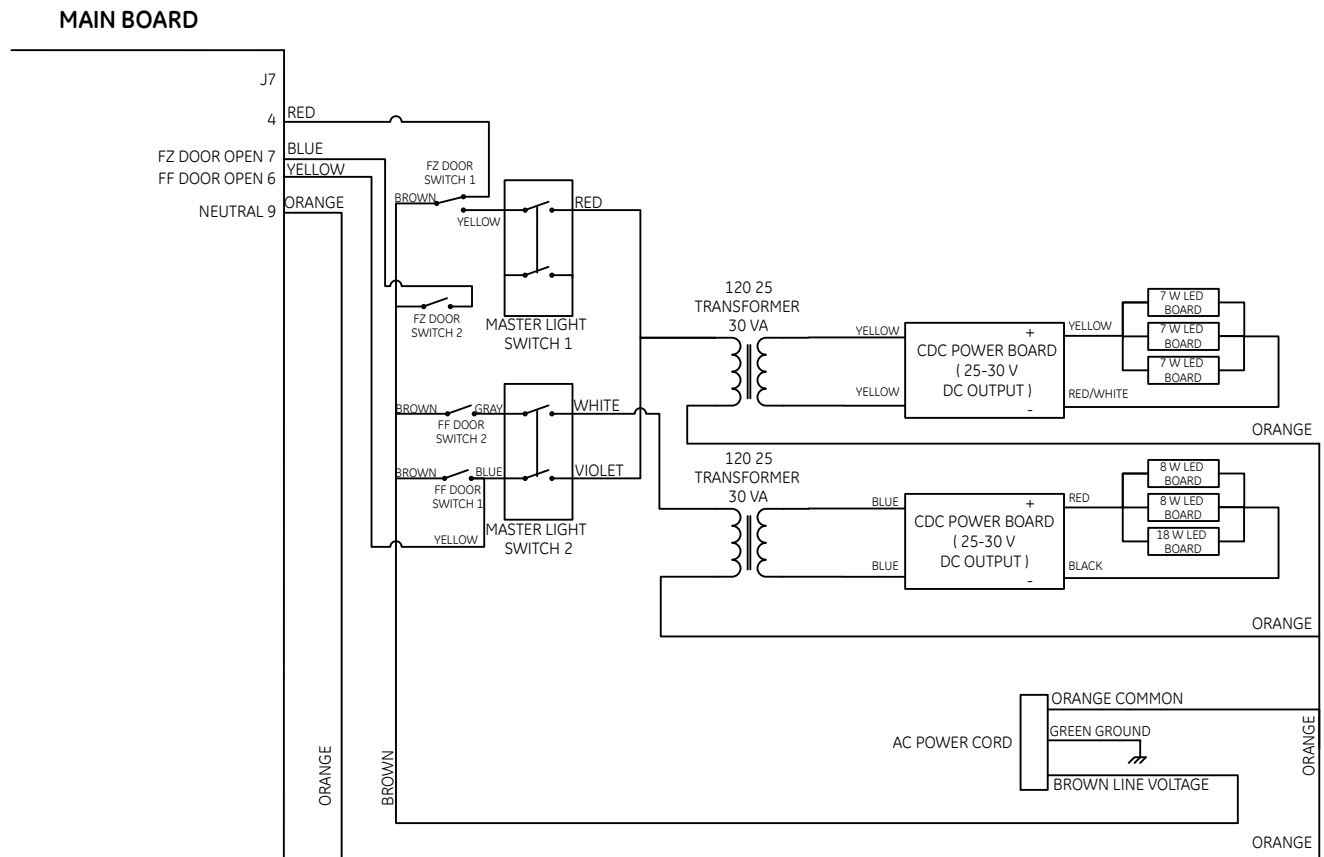
The toe kick is shipped taped to the side of the refrigerator. Install the toe kick assembly with the four screws provided. The LARGER toe kick attaches to the refrigerator using ONLY the top center hole (1). The toe kick skirt attaches to the refrigerator using the three lower slots (2).



A custom toe kick can be installed to match or complement the surrounding cabinetry. Use the supplied toe kick as a template to cut the shape.

Lighting

LED boards provide lighting in the refrigerator. The main board does not supply voltage to the LED boards, rather voltage is supplied through step down transformers to CDC (power boards). When either door is opened, contacts in a pair of door switches close. One switch sends voltage to the main board which informs the board that the door has been opened, the second switch supplies voltage to the step down transformer through a master light switch. Transformers drops the voltage down to 30 VAC for the CDC boards. The 30 VAC is used by the CDC boards to output 25 - 30 VDC to the LED boards.



Master Light Switches

Two master light switches are located on the underside of the main board cover. Since the fresh food tower LED boards and freezer tower LED board each use the left CDC board and left transformer, it is necessary to turn both master switches to the off position to completely turn off the lighting to either compartment.

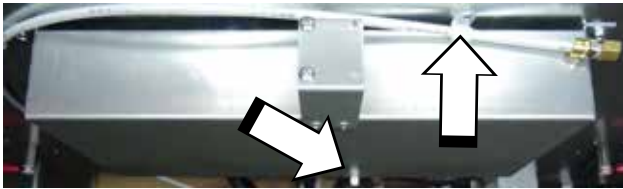


Transformers

The refrigerator utilizes two transformers to step down the voltage for the lighting circuits. Each transformer uses 120 VAC to deliver 30 VAC to the respective CDC board. The left transformer supplies voltage needed to operate the left CDC board, freezer tower LED board, and both fresh food tower LED boards.

Transformer Removal

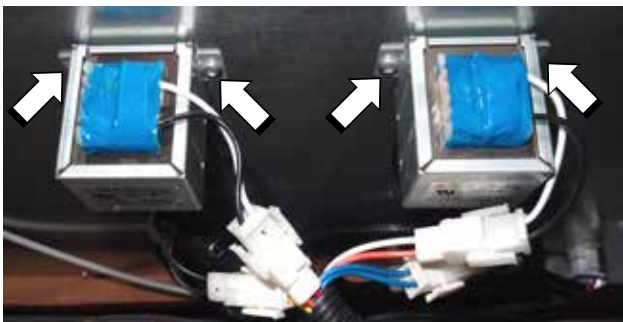
1. Remove the toe kick panel.
2. Clip the wire tie at the rear of the transformer cover and remove one Philips head screw securing the water line to the bottom of the cabinet.



3. Remove the four 5/16 in. hex head screws (two toward the front and two toward the rear of the cover) and loosen the two middle screws.



4. Slide the cover forward slightly and lower the cover.
5. Disconnect the two connectors for the desired transformer.
6. Remove the two Philips head screws for the desired transformer.



Transformer Diagnosing

Incoming and outgoing voltages can be checked at each transformer. The outgoing voltage may also be checked at the CDC boards (see the **CDC Boards (Power Boards)** section).

NOTE:

- Open the door for the transformer being checked, keeping in mind the left transformer is needed for **both** the freezer and fresh food tower lighting.
- Opening the freezer door also turns on the fresh food tower LED boards even if the fresh food door is closed.
- Opening the fresh food door also turns on the freezer tower LED board, even if the freezer door is closed.

Left Transformer:

- Orange to Red = 120 VAC

If 120 VAC is not present to the transformer, check the door switch and master light switch.

- Black to White = 12 ohms
- Black to Black = 30 VAC
- Black to Black = 1 ohm

Right Transformer:

- Orange to White = 120 VAC

If 120 VAC is not present to the transformer, check the door switch and master light switch.

- Black to White = 12 ohms
- Black to Black = 30 VAC
- Black to Black = 1 ohm

CDC Boards (Power Boards)

CDC boards are located in the machine compartment behind the main board cover just below the main board.



Each CDC board utilizes 30 VAC from the transformers to output 25 VDC - 30 VDC for the LED boards.

CDC Board Removal

1. Lift up the grill to access the machine compartment.
2. Remove the four Phillips head screws and carefully swing the main board cover to the left (RJ45 connector and master light switches are connected to the cover).
3. Remove the connectors from the desired board.
4. Release the four tabs in the corners of the CDC board.

CDC Board Diagnosing

Incoming and outgoing voltages can be checked at each CDC board.

NOTE:

- Open the door for the CDC board being checked, keeping in mind the left CDC board is needed for **both** the freezer and fresh food tower lighting.
- Opening the freezer door also turns on the fresh food tower LED boards, even if the fresh food door is closed.
- Opening the fresh food door also turns on the freezer tower LED board even if the freezer door is closed.

Left CDC Board:

- Yellow to Yellow = 30 VAC
- Red/White to Yellow = 25 VDC - 30 VDC

Right CDC Board:

- Blue to Blue = 30 VAC
- Red to Black = 25 VDC - 30 VDC

If 30 VAC is not present at the CDC board, verify transformer functionality (see **Transformer Diagnosing**) and check the transformer connections.

If 30 VAC is present to the CDC board and 25 VDC - 30 VDC is not present, replace the CDC board.

If both voltages are present, check wiring and LEDs.

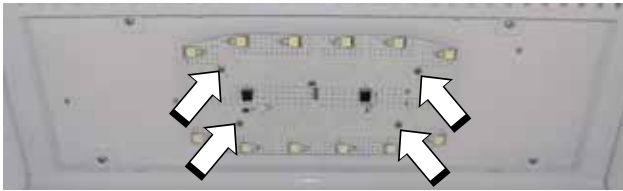
Fresh Food Lighting

The lighting in the fresh food section consists of an upper LED board, two tower LED boards, lighted vegetable drawer shelf, and an LED strip built into the Quick Chill mullion. All fresh food lighting except the fresh food tower LED boards are controlled by the right transformer and the right CDC board. The fresh food tower LED boards are controlled by the left transformer and the left CDC board.

Upper LED Board Removal

The upper LED board is located behind the upper light shield.

1. Remove the upper light shield.
2. Remove the four Phillips head screws.



3. Disconnect the connector.

Vegetable Drawer Shelf Lighting

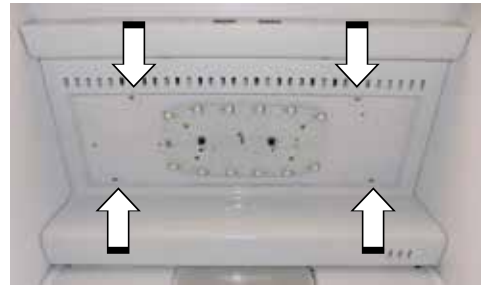
The lighted shelf features an LED strip built into the underside of the shelf above the vegetable drawer. See the **Shelves, Lighted Vegetable Drawer Shelf** section of this guide for more information.

Fresh Food Tower LED Boards Removal

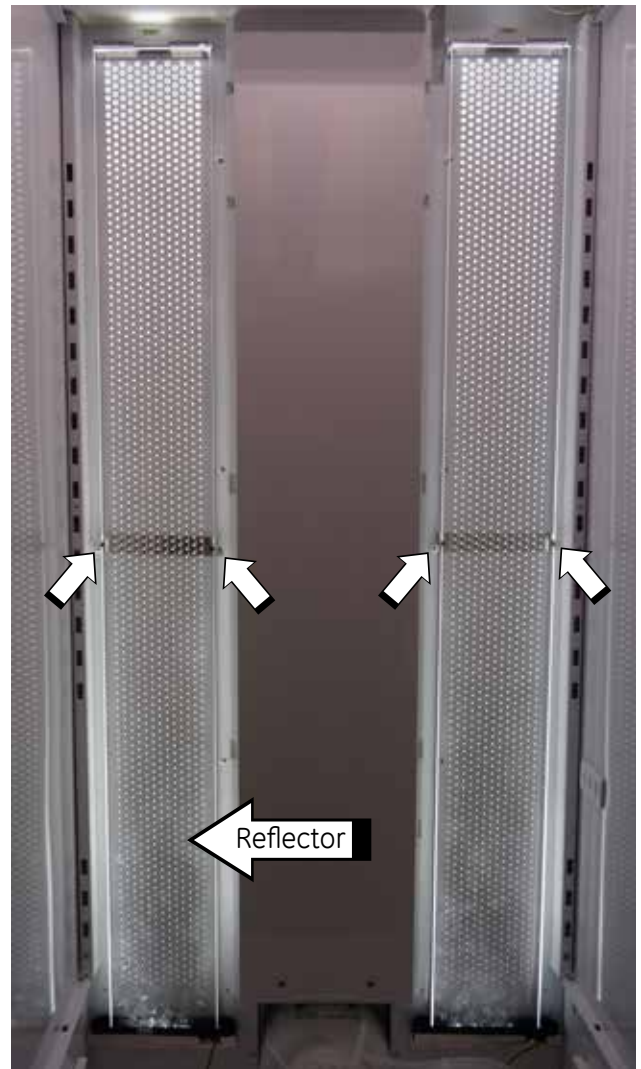
The LED boards are located at the bottom of the tower light shields behind the water tank cover.

1. Remove the shelves and vegetable drawer.
2. Remove the water tank cover.
3. Remove the lighted vegetable drawer shelf.
4. Remove the upper light shield.

5. Remove the four Phillips head screws and remove the LED housing (the FF1 thermistor is clipped to the backside of the housing in the right rear corner).

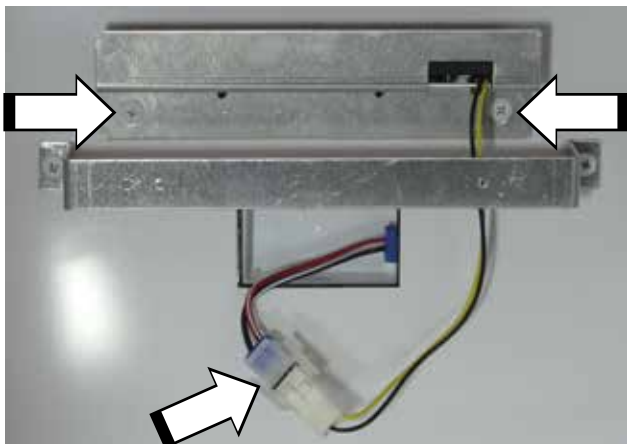


6. Pull the tower LED shield forward to reveal the light reflectors.
7. Removing two Phillips head screws is required to remove each middle reflector bracket.

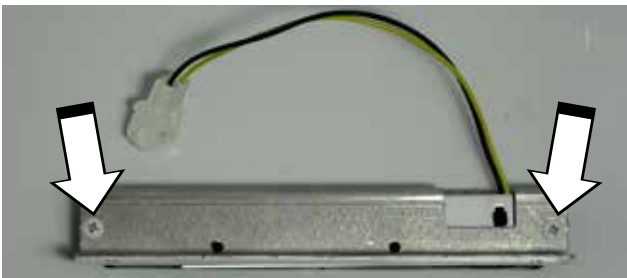


8. Slightly lift up and out on the reflector(s) to unseat the reflector(s) from the tower LED housing(s).

9. Disconnect the LED Board connector(s) and remove two Phillips head screws to remove the LED bracket(s) from the cabinet wall.



10. Remove two Phillips head screws from the bracket to separate the LED housing from the bracket.



11. Lift the tower LED board off of the housing.



Quick Chill Mullion Lighting

The Quick Chill Mullion features LED lighting built into the underside of the mullion to illuminate the custom cool drawer. See the **Quick Chill Mullion** section of this guide for more information. Should the LEDs in the mullion need to be replaced, the Quick Chill Mullion assembly will be required.

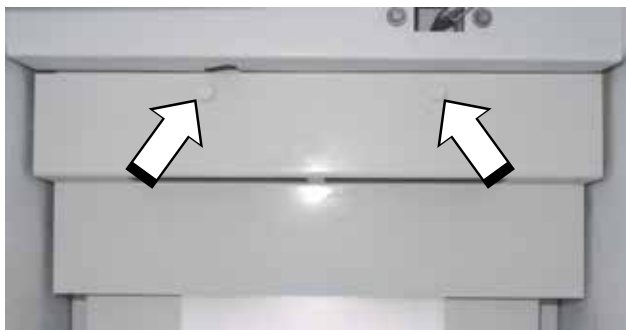
Freezer Lighting

The lighting in the freezer section consists of a single tower LED board. The freezer tower LED board as well as the fresh food tower LED boards are controlled by the left transformer and the left CDC board.

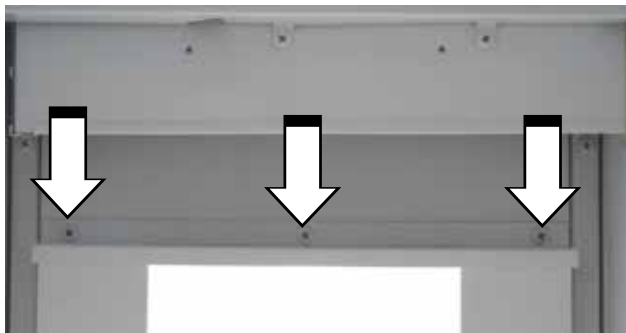
Freezer Tower LED Board Removal

The LED board is located in the bottom of the freezer section behind the tower light shield.

1. Remove the freezer shelves and baskets.
2. Remove the two thumb screws to remove the upper trim panel.

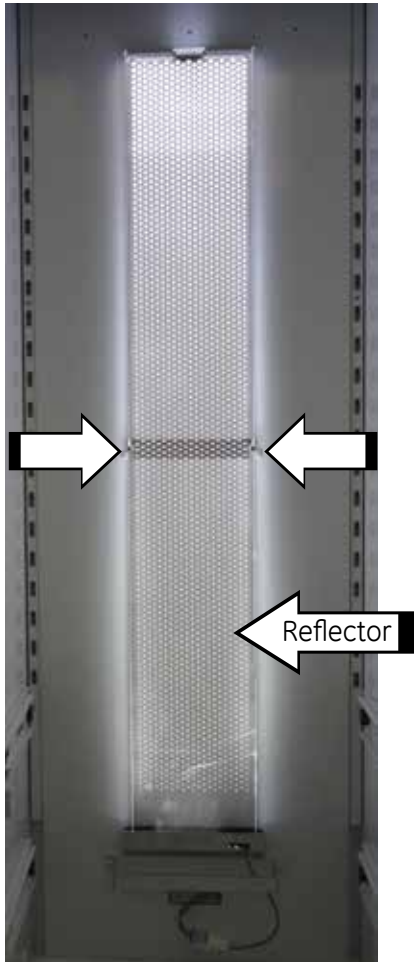


3. Remove the two thumb screws to remove the lower trim panel.
4. Remove three Phillips head screws at the top of the LED shield to remove the trim holding the shield in place.

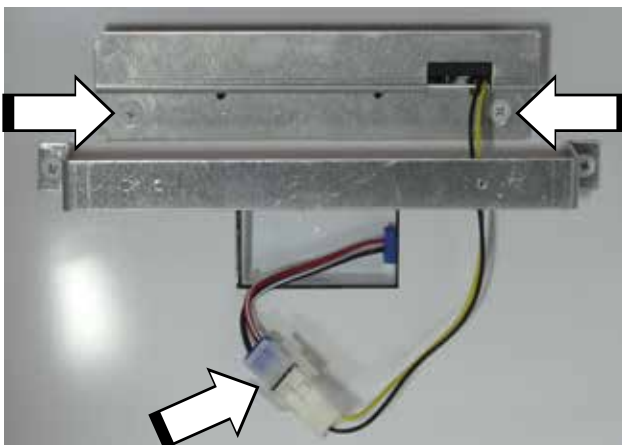


5. Remove the LED shield.

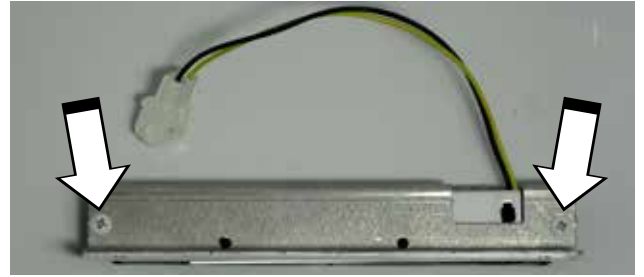
6. Unscrew the two Phillips head screws for the middle brackets which secure the light reflector to the cabinet.



7. Slightly lift up and out on the reflector to unseat the reflector from the tower LED housing.
8. Disconnect the LED Board connector and remove two Phillips head screws to remove the LED bracket from the cabinet wall.



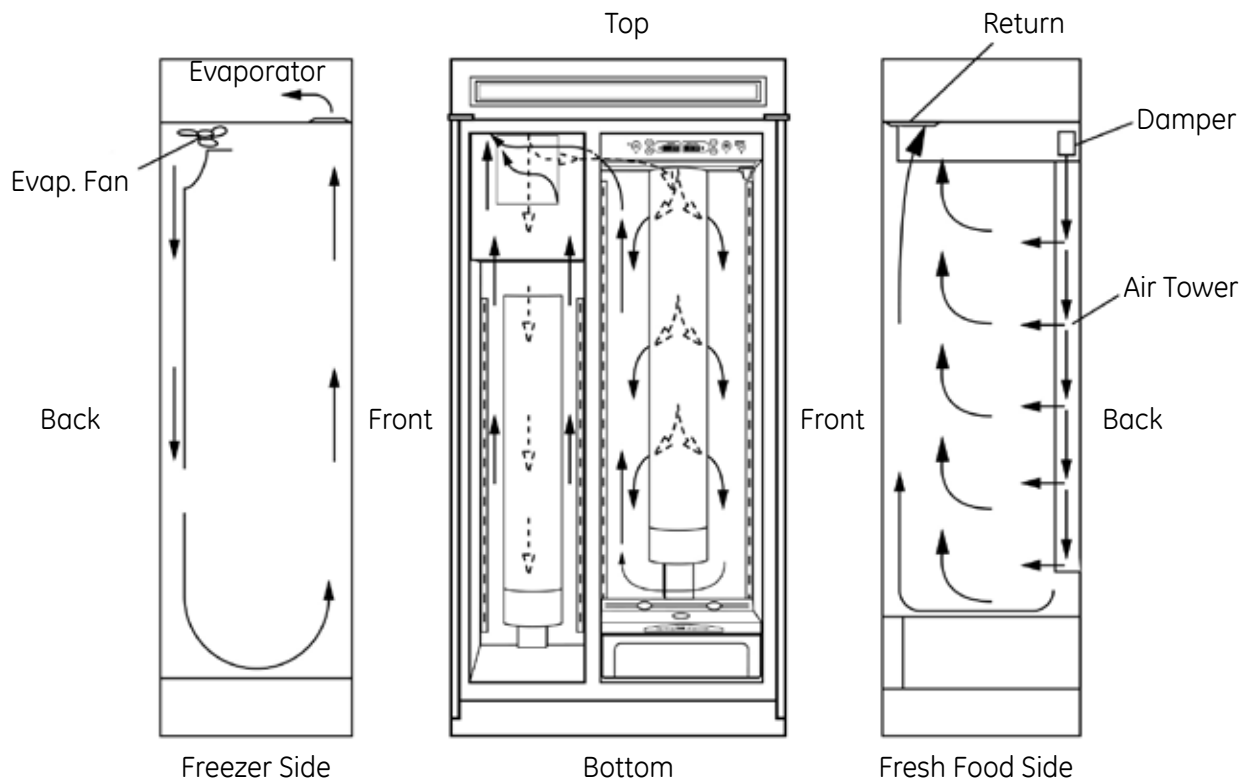
9. Remove two Phillips head screws from the bracket to separate the LED housing from the bracket.



10. Lift the tower LED board off of the housing.



Airflow



Thermistors

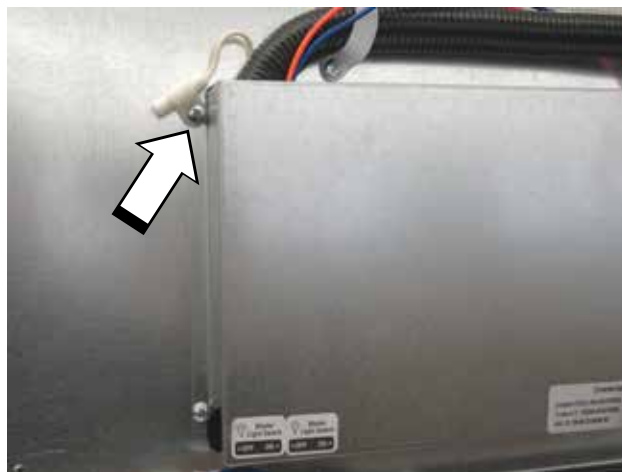
The main board utilizes six thermistors to read the temperatures inside and outside the refrigerator. To test the thermistors use the chart below.

Thermistor Values		
Temperature Degrees (°F)	Temperature Degrees (°C)	Resistance in Kilo-ohms
-40°	-40°	166.8k
-31°	-35°	120.5k
-22°	-30°	88k
-13°	-25°	65k
-4°	-20°	48.4k
5°	-15°	36.4k
14°	-10°	27.6k
23°	-5°	21k
32°	0°	16.3k
41°	5°	12.7k
50°	10°	10k
59°	15°	7.8k
68°	20°	6.2k
77°	25°	5k
86°	30°	4k
95°	35°	3.2k
104°	40°	2.6k
113°	45°	2.2k
122°	50°	1.8k
131°	55°	1.5k
140°	60°	1.2k

NOTE: To accurately test a thermistor, place the thermistor in a glass of ice and water (approximately 33°F) for several minutes and check for approximately 16k.

Ambient Thermistor

The ambient thermistor is located in the left side of the machine compartment, and mounted to the top of the main board cover with one Phillips head screw.



The ambient thermistor assists the main control board in compensating for room ambient that is higher or lower than 60°F.

For example, in ambient temperature below 60°F, the fresh food temperature control will shut down properly. The cooler room ambient assists in keeping fresh food temperatures at the preset temperature. However, the compressor does not run enough to bring the freezer down to 0°F.

At lower room temperatures, the ambient thermistor alters the main control board's calculations for the target temperature. The main control board then runs the compressor at higher speeds to get the freezer, as well as the fresh food, to an acceptable temperature.

If the external thermistor is not functioning, the main control board default will assume the ambient temperature is 90°F and there will be no adjustment to the fresh food or freezer set point.

Ambient Thermistor Diagnosing

The ambient thermistor resistance can be checked between J14 and J5 connectors at the main board.

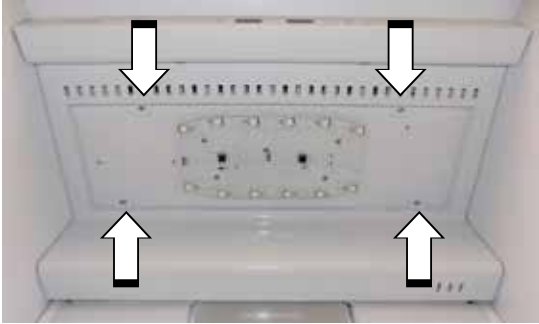
- J14 pin 1 (**white**) - J5 pin 5 (**brown**)

Fresh Food Thermistors

The fresh food section has two thermistors (FF1 and FF2). FF1 thermistor is located in the right rear of the upper LED cover.

FF1 Thermistor Removal

1. Remove the upper LED shield.
2. Lower the upper LED housing by removing four Phillips head screws.



3. Remove the Permugum™ around the thermistor and pull the thermistor out of the housing.



The FF2 thermistor is located on the middle of the right fresh food wall, clipped to the backside of a sensor grill.

FF2 Thermistor Removal

1. Carefully pry the top of the thermistor grill away from the cabinet with a flat blade screwdriver.



2. Unclip the sensor from the grill.



FF1 and FF2 Thermistor Diagnosing

The FF1 and FF2 thermistor resistances can be checked on the J1 connector at the main board.

- FF1 = J1 pin 1 (**black**) to pin 5 (**brown**)
- FF2 = J1 pin 2 (**red**) to pin 5 (**brown**)

Freezer Thermistor

The freezer thermistor is located on the right wall of the freezer compartment. To remove the thermistor, follow the previous steps and images for **FF2 Thermistor Removal**.

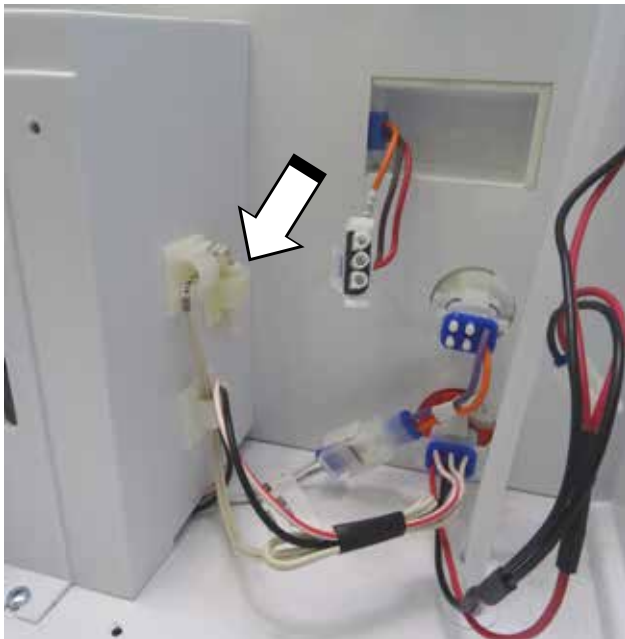
Freezer Thermistor Diagnosing

The freezer thermistor resistance can be checked on the J1 connector of the main board.

- J1 pin 3 (**blue**) to pin 5 (**brown**)

Quick Chill Thermistor

The Quick Chill thermistor is clipped to the right of the Quick Chill fan assembly. See the **Accessing Quick Chill Components** section for information on accessing the thermistor.



Quick Chill Thermistor Diagnosing

The Quick Chill thermistor resistance can be checked on the J5 connector of the main board.

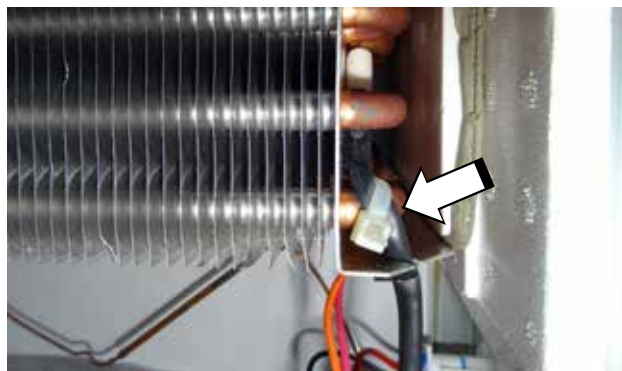
- J5 pin 5 (**brown**) to pin 6 (**blue**)

Evaporator Thermistor

The evaporator thermistor is wire tied to the right side of the evaporator. The main board uses this thermistor to monitor and terminate defrost cycles.

Evaporator Thermistor Removal

1. Follow the steps for **Drain Pan Assembly Removal**.
2. Cut the wire tire.



NOTE: Use a wire tire to reattach the thermistor. Wire tying the thermistor ensures that the thermistor stays in place. Failure to do so may lead to future service due to defrost issues.

Evaporator Thermistor Diagnosing

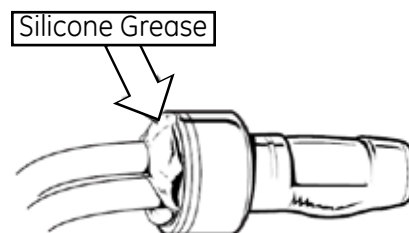
The freezer evaporator thermistor can be checked on the J1 connector of the main board.

- J1 pin 4 (**white**) to pin 5 (**brown**)

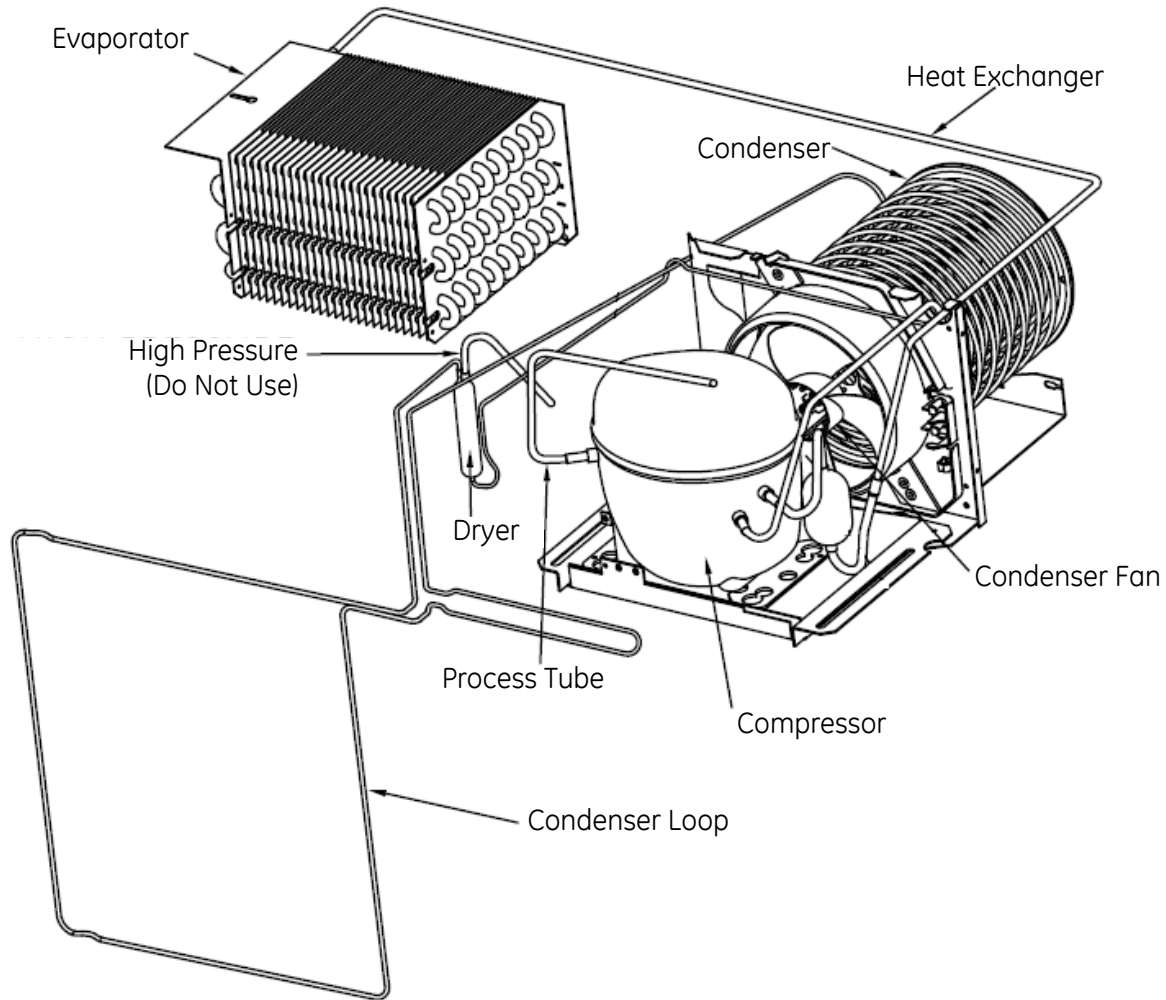
Replacing Thermistors

To replace a faulty thermistor, the existing thermistor will need to be cut from the harness and the new thermistor will be spliced in its place.

NOTE: It is important to follow proper procedure for splicing wires. New connections should use bell connectors filled with a silicone grease (such as **Part #**: WR97X163 or equivalent).



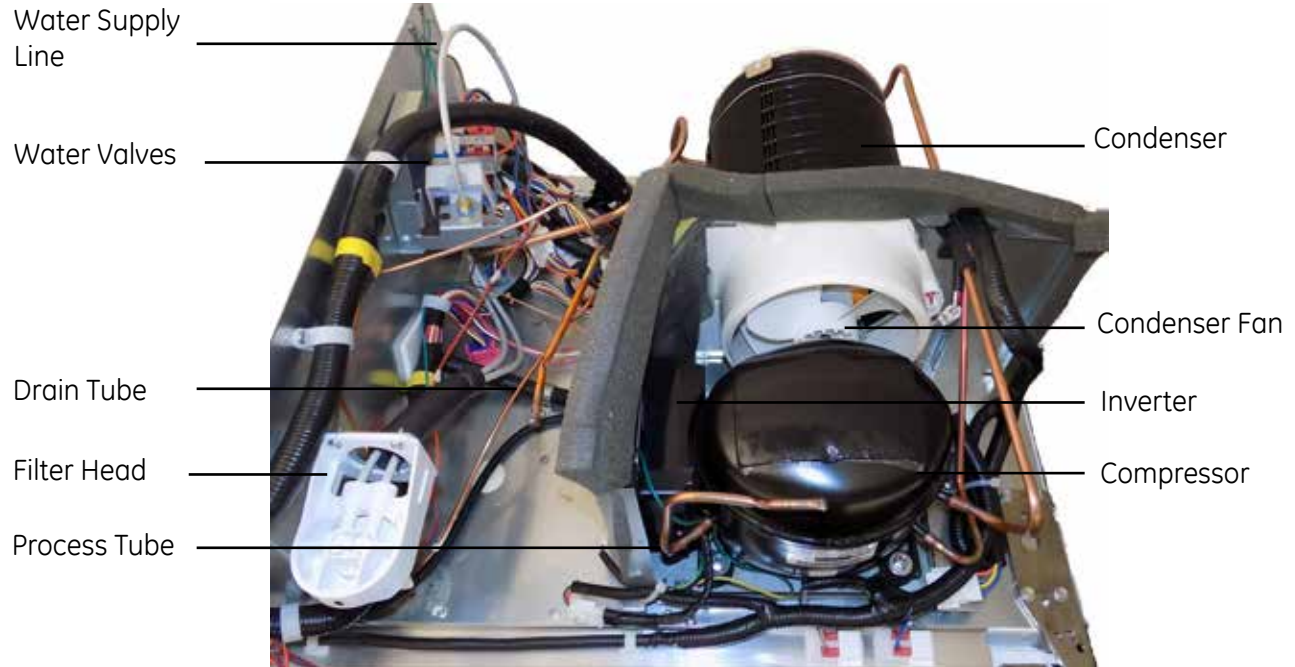
Cooling System



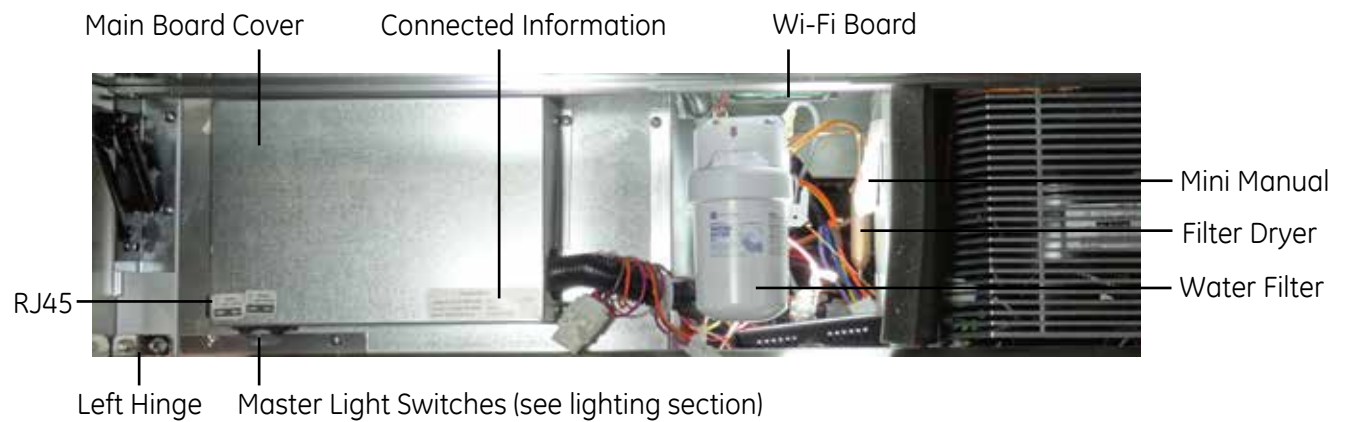
NOTE: The heat exchanger is foamed into the cabinet and is not replaceable, exposed sections in the machine compartment may be repaired if far enough away from the cabinet entry point.

Machine Compartment

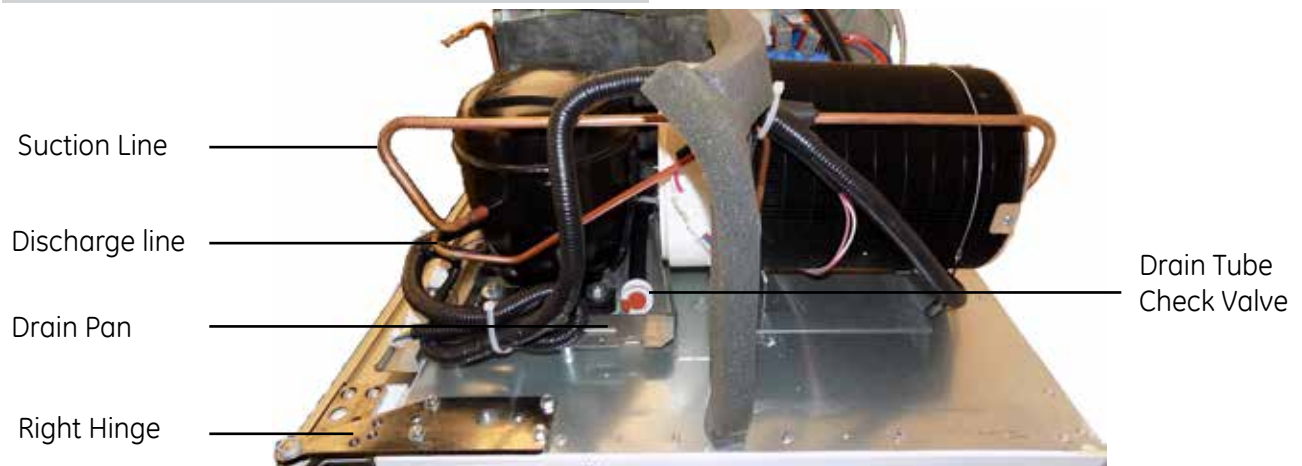
Top View Component Locator



Front View Component Locator



Right Top View Component Locator



RJ45 Connector

The RJ45 connector is located in the lower left side of the main board cover. The connector is an access point to the main board (J4), which can allow technicians to update the main board software or in some cases operate diagnostic programs.



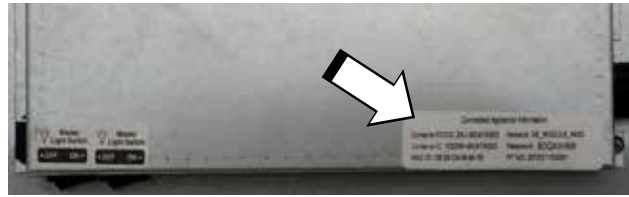
Wi-Fi Board

The Wi-Fi board allows the consumer to interface with the refrigerator via the Monogram Connected Kitchen app. Through the app, the consumer can adjust temperatures of the refrigerator, check if the icemaker is full or empty, and get alerts if the refrigerator experiences a power outage.

The board is located on the ceiling of the machine compartment, behind the filter head assembly.



Each board has its own unique connected information, located on the lower right corner of the main board cover. Should the Wi-Fi board need to be replaced, a new connected information tag will be provided with the board.



Wi-Fi Board Removal

1. Raise the top grill to access the machine compartment.
2. Remove one Phillips head screw.



3. Lower the board and disconnect the connector.

Wi-Fi Board Diagnosing

The Wi-Fi board is operated off 13 VDC supplied by the main board. Voltage can be checked at the J4 connector of the main board, or at the Wi-Fi board connector. A green LED on the board will be blinking, indicating communication with the main board.

Main Board:

- J4 pin 3 (**orange**) to J4 pin 4 (**violet**) = 13 VDC
- J4 pin 4 (**violet**) to J4 pin 5 (**red**) = 13 VDC

Wi-Fi Board Connector:

- **Brown** to **Orange** = 13 VDC
- **Brown** to **Red** = 13 VDC

Main Board

The main board is located in the machine compartment and controls all the functions of the refrigerator. The board is supplied with 120 VAC on J11 and will deliver AC and DC voltage to operating components. Voltage checks can be made at the connectors on the board.

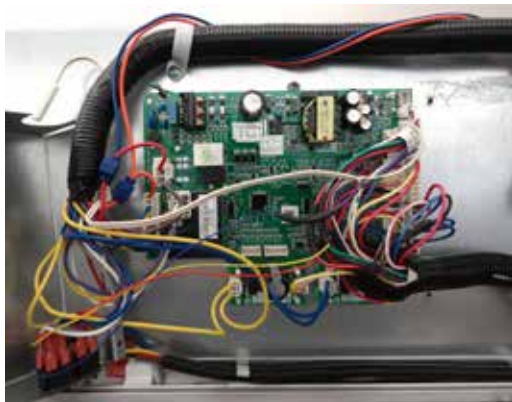
Main Board Removal

Raise the top grill to access the machine compartment.

Remove the four Phillips head screws.



Carefully swing the main board cover to the left. The RJ45 connector and master light switches are connected inside the cover.



Disconnect the connectors and release the four tabs in each corner of the board.



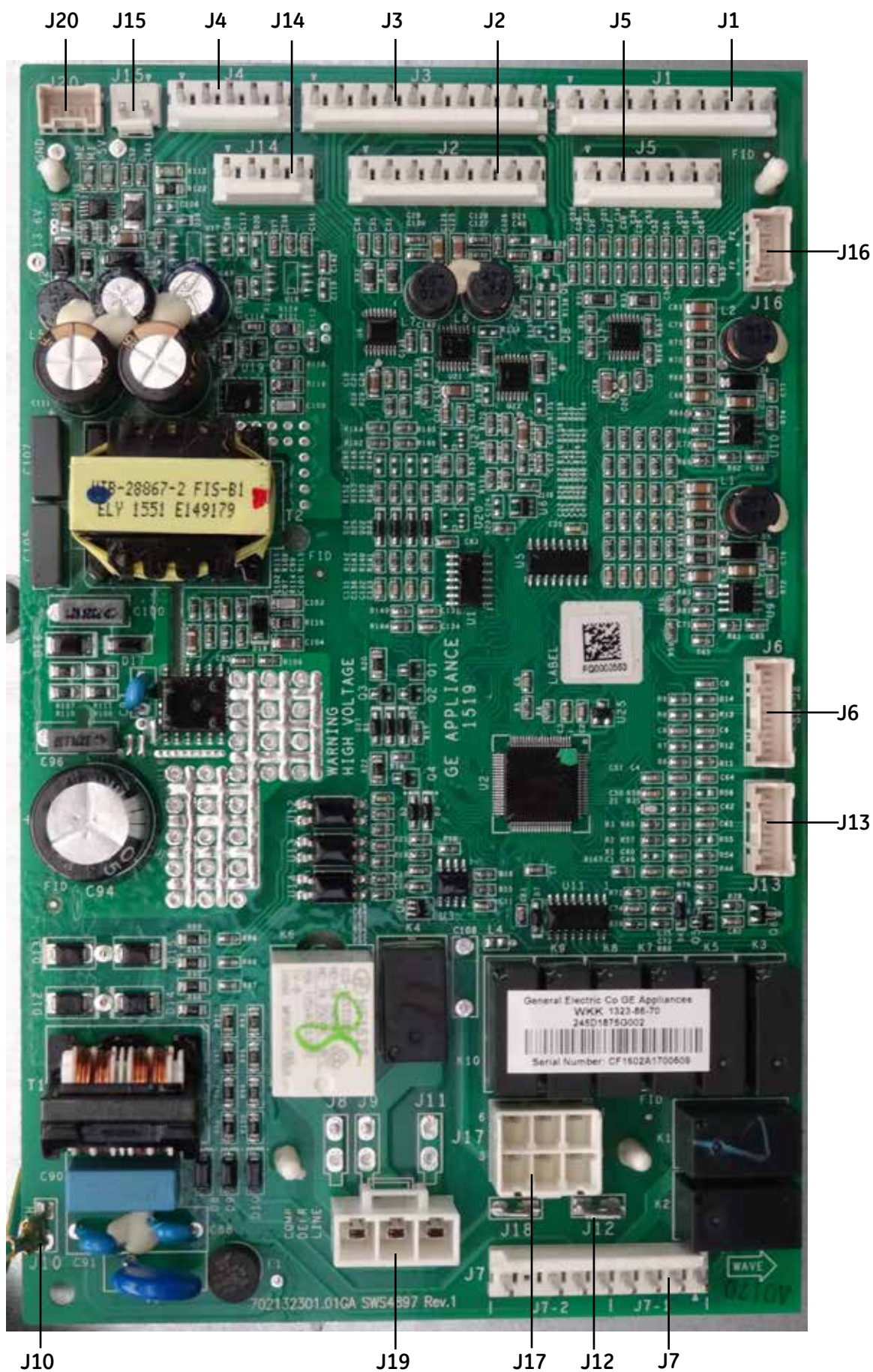
Main Board Diagnosing

When checking for a dead or nonresponsive main board, verify supply voltage to the board at J19 to neutral at J7, and then check communication voltage at J4. A green LED on the board will blink during normal operation. The flashing pattern does not indicate any faults, only that the main board has communication. If the green LED is not blinking it may be an indication of a bad main board or a supply voltage issue to the refrigerator.

- J19 pin 3 (**brown**) to J7 pin 9 (**orange**) = 120 VAC
- J4 pin 2 (**brown**) to J4 pin 3 (**orange**) = 13 VDC
- J4 pin 2 (**brown**) to J4 pin 4 (**violet**) = 13 VDC

NOTE: If not voltage is present when checking VDC at J4, remove all other DC components from the board is case a component is shorted and then retest the voltage at J4. Once voltage is present at J4 on the main board, reconnect DC connectors one at a time to determine which circuit contains the shorted component.

Main Board Connector Locations



Main Board Connector Locations (continued)

J1-1: Fresh food 1 thermistor input
J1-2: Fresh food 2 thermistor input
J1-3: Freezer thermistor input
J1-4: Evaporator thermistor input
J1-5: +5 VDC output to ff, fz and evap thermistors
J1-6: Open
J1-7: Open
J1-8: Model ID jumper from J1-5
J1-9: Model ID jumper from J1-5

J2-1: Freezer fan RPM feedback
J2-2: Model ID
J3-3: Board DC Ground
J2-4: Freezer fan PWM
J2-5: Condenser fan PWM
J2-6: FF fan duty cycle
J2-7: Quick Chill fan
J2-8: +13.2 VDC

J3-1: Damper motor
J3-2: Damper Motor
J3-3: Damper motor
J3-4: Damper motor
J3-5 - 10: Open

J4-1: Communications
J4-2: +13.6 VDC
J4-3: Board DC Ground
J4-4: +13.6 VDC
J4-5: Communications

J5-1: Quick Chill damper motor
J5-2: Quick Chill damper motor
J5-3: Quick Chill damper motor
J5-4: Quick Chill damper motor
J5-5: +5 VDC output to Quick Chill thermistor
J5-6: Quick Chill thermistor input

J6: Not used

J7-1: 120 VAC output to auger motor
J7-2: 120 VAC output to crushed/cubed solenoid
J7-3: 120 VAC output to dispenser water valve
J7-4: Freezer door closed 120 VAC input
J7-5: 120 VAC output to Quick Chill heater
J7-6: Fresh Food door open 120 VAC input
J7-7: Freezer door open 120 VAC input
J7-8: Open
J7-9: VAC neutral

J10: Chassis ground (line noise)

J12: 120 VAC output to pan heater

J13: Not used

J14-1: Ambient thermistor input
J14-2: Open
J14-3: Open
J14-4: Open

J15-1: Inverter Pulsed + 4 - 6 VDC
J15-2: Inverter (-) 4 - 6 VDC

J16: Not used

J17-1: Open
J17-2: 120 VAC input from icemaker
J17-3: Open
J17-4: 120 VAC output to isolation valve
J17-5: Open
J17-6: 120 VAC output to icemaker valve

J19-1: Open
J19-2: 120 VAC output to defrost and fill tube heaters
J19-3: 120 VAC input (line and icemaker voltage)

J20: Not used

Inverter

The inverter receives commands from the main control board. The main control board will send a PWM (**P**ulse **W**idth **M**odulation) run signal from the J15 connector of between 4 VDC to 6 VDC effective voltage to the inverter (all wires must be connected). The inverter will select compressor speed (voltage and frequency output) based on this signal. The main control board will only send a run signal to the inverter when the compressor should be on.

NOTE: When measuring signal voltage (from the main control board) at the inverter, a reading of 4 VDC to 6 VDC will be measured with all wires connected. If the inverter wiring is disconnected, the board output will measure between 10 VDC to 12 VDC.

Inverter Diagnosing

Signal voltage can be checked at the J15 connector on the main board or at the DC inverter connector.

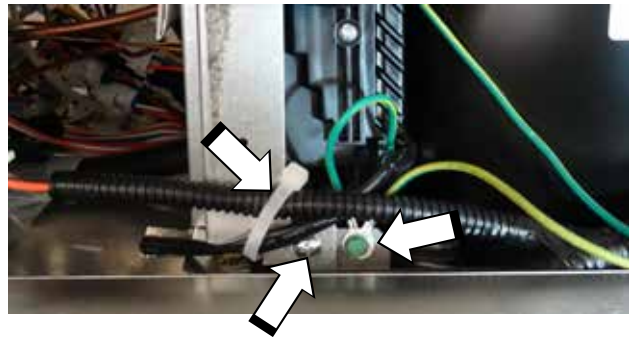
- J15 pin1 (**white**) to J15 pin 2 (**red**) = 10 - 12 VDC when harness is disconnect
- J15 pin1 (**white**) to J15 pin 2 (**red**) = 4 - 6 VDC with connected harness

Inverter Removal

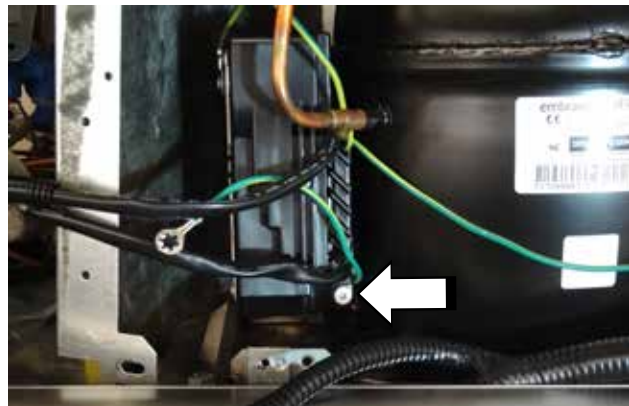
1. Raise the top grill to access the machine compartment.
2. Remove the two Phillips head screws for the compressor grill and set the grill aside (the left screw is hidden behind the foam baffle).



3. Remove the wire tie, the Phillips head screw, and the 1/4 in. hex head screw.



4. Push the compressor panel to the left.
5. Disconnect the AC and DC connectors.
6. Remove the Phillips head screw securing the inverter to the compressor.



7. Lift up on the inverter and disconnect the connector from the compressor.

Inverter Compressor

The compressor is a reciprocating, variable speed, 4-pole type. It operates on 3-phase, 80 to 230 VAC within a range of 57 to 104 Hz.

An inverter controls the speed of the compressor by frequency variation and by **P**ulse **W**idth **M**odulation (PWM). Changing frequency and PWM will cause an effective voltage between 80 and 230 VAC to be received at the compressor.

Each winding of the compressor should be approximately 12.4 ohms.

Caution: Do not attempt to direct-start the compressor. The compressor operates on a 3-phase power supply. Applying 120 VAC to the compressor will permanently damage the unit. It is not possible to start the compressor without an inverter.

NOTE: Some voltmeters will not be able to read voltage output or frequency from the inverter and it is not recommended that it be measured.

Compressor Removal

1. Follow steps 1 - 7 of **Inverter Removal**.
2. Recover the refrigerant.

Caution: Protect the wiring from heat during desoldering and re-soldering (if brazing).

3. De-solder the suction tube (if brazing), or cut the tube closest to the evaporator connection (if using LokRing).
4. De-solder the discharge line (if brazing) or cut the tubing closest to the evaporator connection (if using LokRing).
5. Remove the four 7/16 in. nuts and the washers from the compressor base.
6. Lift the compressor off of the compressor studs.

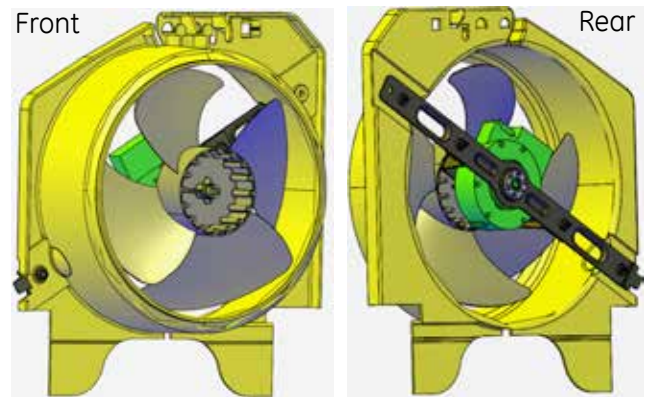
Important: The filter dryer should be replaced when any sealed system repair is performed. Refer to the mini manual or the model/serial tag for the exact refrigerant type and charge quantity.

Condenser Fan

The condenser fan is a permanent magnet 4-pole, DC motor that operates at three different speeds: high, medium*, and low*. The speed of the fan is controlled by the voltage output from the main control board. Voltage output from the control board to the fan is 13.6 VDC; however to regulate the speed of the fan, the main control board uses **Pulse Width Modulation (PWM)**. When operating, voltage is sent in pulses (much like a duty cycle) as opposed to an uninterrupted flow. This pulsing of 13.6 VDC produces an effective voltage reduction. The main control board selects and regulates fan speed and varies the length and frequency of the 13.6 VDC pulse. The main control board does not monitor the speed of the motor.

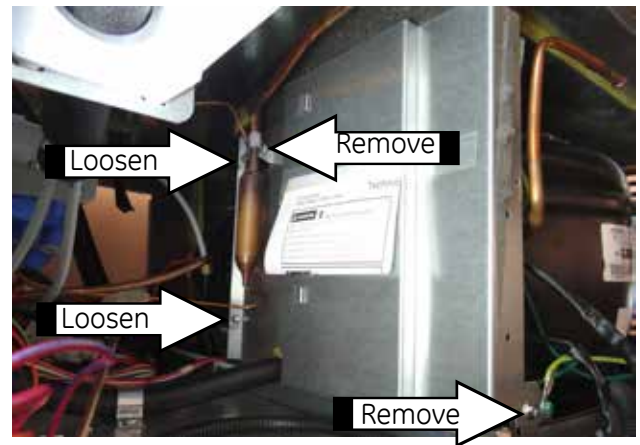
- **High:** 96.00% PWM: 12 - 13 VDC
- **Med/Low:** 34.25% PWM: 4 - 5 VDC

*Medium and low speeds are the same.



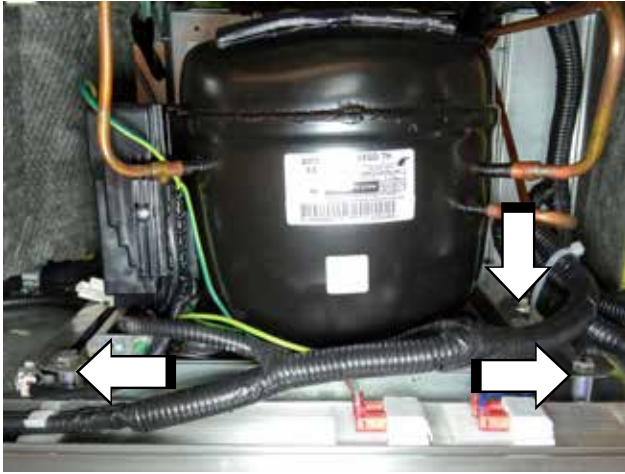
Condenser Fan Removal

1. Raise the top grill to access the machine compartment.
2. Remove the grill in front of the compressor.
3. Remove the stainless steel trim, covering the wiring to the door switches.
4. Remove one Philips head screw securing the clamp for the filter dryer and carefully push the filter dryer to the left. Remove one screw in front of the compressor panel and loosen the two Phillips head screws in the rear.



5. Lift the compressor panel up and remove the panel from the machine compartment.

6. Remove the three 7/16 in. compressor pan bolts.



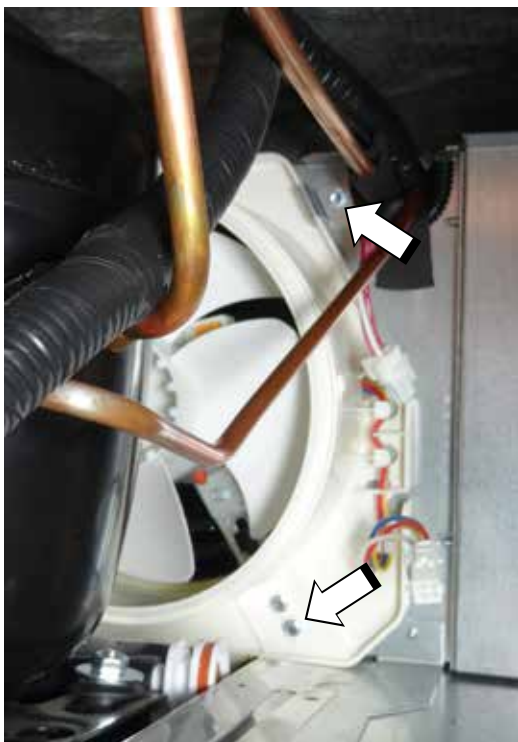
7. Remove the 1/4 in. screw in the upper left corner of the condenser fan shroud.



8. Carefully lift the compressor and pan up, pull forward and to the left to access the right screws for the condenser fan shroud (making sure not to kink any of the sealed system tubing).

9. Disconnect the fan connector.

10. Remove the two 1/4 in. hex head screws in the right side of the fan shroud.



11. Carefully move the compressor and pan up and to the right as much as possible.

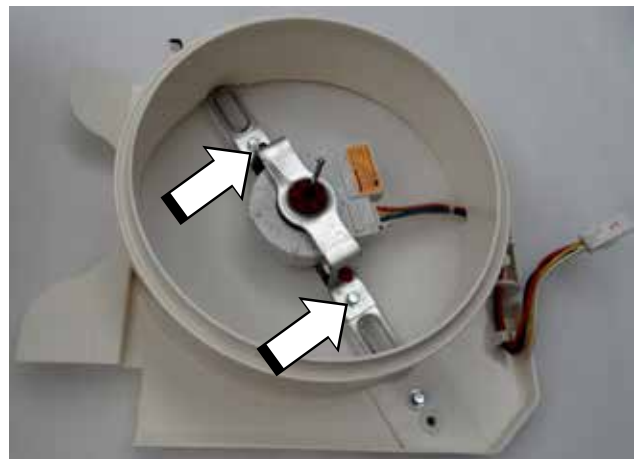
12. Lower the shroud.

13. Pull the shroud and fan out to the left of the compressor.

14. Pull the fan blade off of the motor shaft.

NOTE: Check the blade orientation and that the distance the blade is pushed down on the shaft is about 7/16 inch. A fan blade which is not pushed far enough onto the shaft may hit the sealed system tubing or harness wiring, causing the fan to be obstructed.

15. Remove the two 1/4 in. screws to separate the motor from the fan bracket.



Condenser Fan Diagnosing

Checking from the main board, approximate operating voltages can be read at the J2 connector.

- J2 pin 8 (**red**) - J2 pin 3 (**white**) = ~12 VDC
- J2 pin 5 (**pink**) - J2 pin 3 (**white**) = 4 - 12 VDC

Condenser

Behind the condenser fan is a roll of steel tubing referred to as the condenser. The condenser dissipates the heat energy extracted from inside the refrigerator to outside the cabinet with aid from the airflow produced by the condenser fan.

Condenser Removal

1. Follow steps 1 - 6 of **Condenser Fan Removal**.
2. Recover the refrigerant.

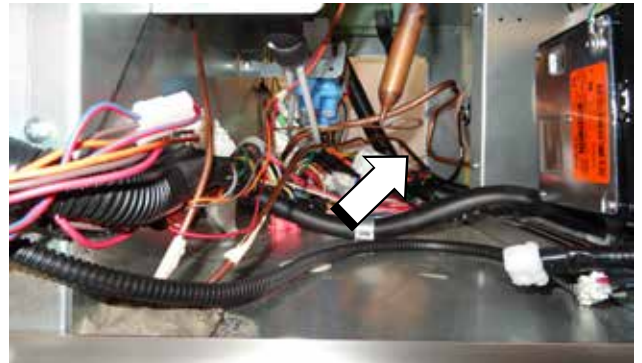
Caution: Protect wiring from heat during de-soldering and re-soldering (if brazing).

3. De-solder the compressor suction tube (if brazing) or cut the tube closest to the compressor connection (if using LokRing).
4. De-solder the compressor discharge line (if brazing) or cut the tubing closest to the compressor connection (if using LokRing).
5. Remove the four 7/16 in. nuts and the washers from the compressor base.
6. Lift the compressor off of the compressor studs.
7. Follow steps 7, 9, 10, and 12 of **Condenser Fan Removal**. Remove the condenser fan and the shroud.
8. Disconnect the door switch wiring for each switch (make note of wire placement).
9. Remove the six Phillips head screws securing the switch plate to the cabinet, and set the plate aside.



Caution: Protect wiring from heat during de-soldering and re-soldering (if brazing).

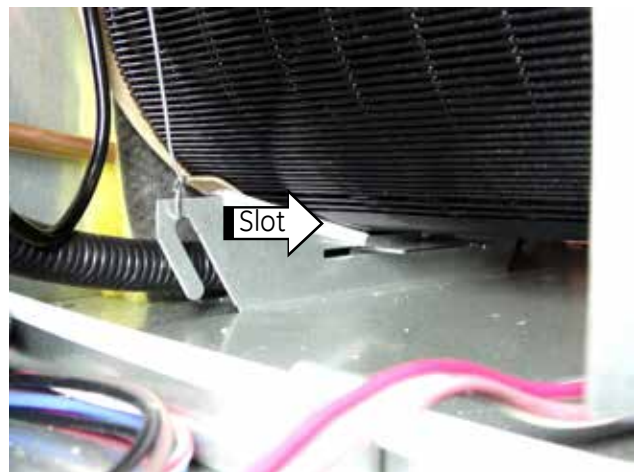
10. De-solder the cabinet discharge tube and condenser joint (if brazing) or cut the tube closest to the condenser connection (if using LokRing).



11. Slide the system pan bracket and condenser forward to remove the condenser.
12. Disconnect the condenser from the system pan bracket.

Important: The filter dryer should be replaced when any sealed system repair is performed. Refer to the mini manual or the model/serial tag for the exact refrigerant type and charge quantity.

NOTE: When sliding the new condenser and pan system bracket back into place, the rear bracket needs to slide into a slot on the backside of the system pan bracket. If the system pan bracket isn't sliding back enough, check to see if the rear bracket slid into the slot on the system pan bracket.



Water System

Water components for the icemaker are located in the middle of the machine compartment. The system is made up of a manifold, filter or bypass, isolation valve, and ice and water valve.

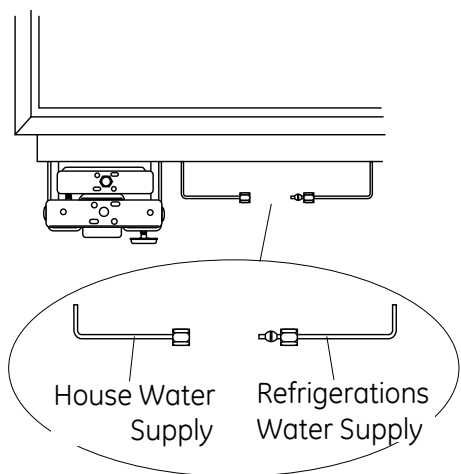
When the dispenser or icemaker calls for water, water will travel through the supply line, to the isolation valve, to the filter head assembly, through a MWFP filter or bypass plug, to the ice and water valve. If the icemaker is calling for water, the ice side of the valve will be activated allowing water through the icemaker supply line, through the fill tube, and then into the icemaker. If the dispenser (on select models) is calling for water, the dispenser side of the valve will be activated allowing water into the cabinet through the water tank, out the cabinet to the bottom of the freezer door, through the freezer door, and then out the dispenser.

Refrigerator Water Supply Line

The refrigerator's water supply line connects to the house supply line at the bottom of the refrigerator and travels to the machine compartment via channel in the rear of the cabinet to the isolation valve. The line is secured to the cabinet with plastic clamps that are screwed into the cabinet at the bottom of the cabinet and in the rear. Changing the supply line requires the use of a technician, as the refrigerator will need to be pulled out to access the plastic clamp behind the rear channel cover.

Supply Line Removal

1. Remove the toe kick.
2. Turn the water supply to the refrigerator off and disconnect the house supply line under the cabinet.



3. Uninstall and pull the refrigerator from the cabinetry.
4. Remove the three clamps holding the water line to the underside of the cabinet with Philips head screws.

5. Remove three Phillips head screws securing the channel cover to the cabinet and set the cover aside.



6. Remove the one clamp holding the water line the rear of the cabinet with a single Phillips head screw.
7. Remove the water line from the isolating valve using a 1/2 in. wrench.

Water Filter Cartridge

The water filter cartridge is located behind the grill panel at the top of the refrigerator. Lift up the panel to access the cartridge.

When to Replace the Filter

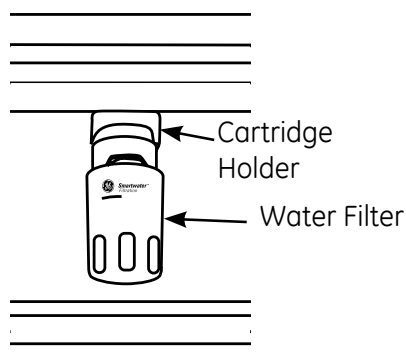
The filter cartridge is designed to filter 300 gallons of water. It should be replaced when the status light turns red, or if the ice cubes are getting hollow or small.



Filter Cartridge Installation

1. Raise the grill panel at the top of the refrigerator.
2. Remove the old cartridge by slowly turning it to the left. A small amount of water may drip down. Do not pull down on the cartridge.
3. Fill the new cartridge with water from the tap to allow for better flow immediately after installation.
4. Line up the arrow on the cartridge with the center of the holder. Do not push it up into the holder.
5. Slowly turn it to the right until the cartridge stops. It will rotate about 1/4 turn.

DO NOT OVERTIGHTEN!



IMPORTANT NOTE: Remove the water filter to immediately stop any water leak from the Icemaker/Dispenser system. The water filter cartridge holder (bracket) acts as a cut-off valve when the filter is removed and will prevent further leaking.

To Reset the Filter Status Light

Press and hold the **RESET** pad for 3 seconds.

Filter Bypass Plug

The filter bypass plug **must** be used:

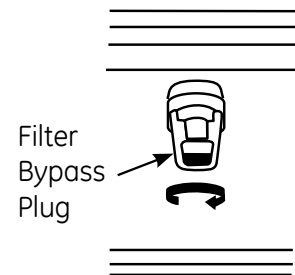
1. If there is a household reverse osmosis water system and/or another form of home water filtration system,

OR

2. If a replacement filter is not available.

The bypass plug and the mini manual are located in the top machine compartment.

The icemaker will not operate without the filter or filter bypass plug installed.



For the maximum benefit of the filtration system, GE recommends the use of **GE branded SmartWater filters** only. Using GE branded filters in GE and Hotpoint® refrigerators provides optimal performance and reliability. GE branded SmartWater filters are always the right choice because they are patented and designed specifically for GE products.

GE SmartWater filters meet rigorous industry NSF standards for safety and quality that are important for products that are filtering the water. GE has not qualified non-GE branded filters for use in GE and Hotpoint refrigerators and there is no assurance that non-GE branded filters meet GE's standards for quality, performance and reliability.

Replacement MWFP filters:

To order additional MWFP filter cartridges in the United States, visit our Website at GEAppliances.com, or call GE Parts and Accessories, 800.626.2002.

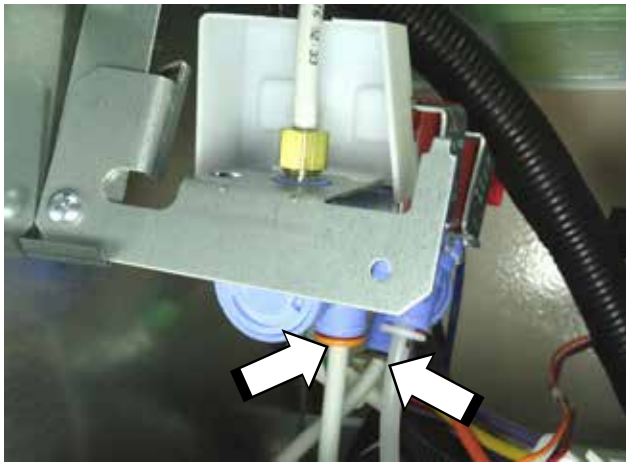
Customers in Canada should consult the yellow pages for the nearest Mabe Service Center.

Filter Head Assembly

The filter head assembly is located in the machine compartment. The assembly is made up of the housing (which the water filter or bypass plug twists into) and water lines going to the water valve assembly.

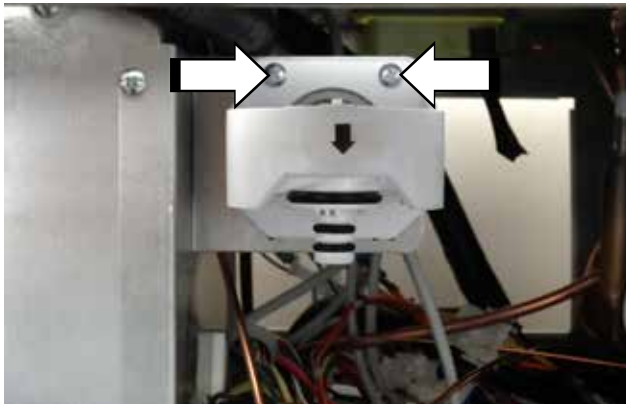
Filter Head Assembly Removal

1. Raise the machine compartment grill.
2. Remove the filter or bypass plug.
3. Disconnect the both filter head water lines at the valves by pressing in on the collars of the valves and pulling down on the water lines.



NOTE: The collars are orange and brown, the water line labeled blue connects to the isolation valve (orange collar) and the water line labeled red connects to the ice and water valve (brown collar).

4. Remove the two Phillips head screws securing the filter head assembly to the mounting bracket.



5. Tip the filter head assembly down and lift up to release two tabs from the mounting bracket.
6. Pull the assembly through the mounting bracket.

Water Valve Assembly

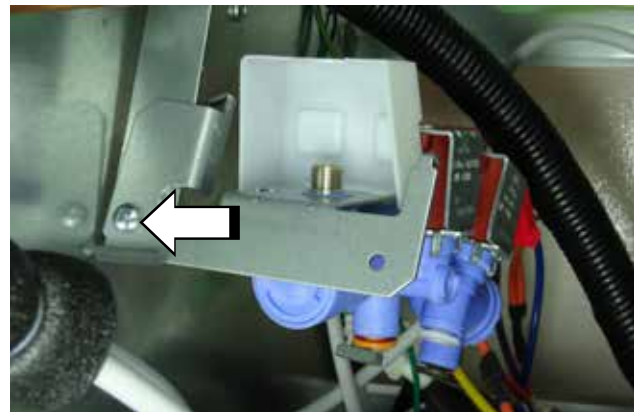
The water valve assembly is made up of an isolation valve and dual valve (ice and water). One side of the dual valve is not used on non-dispense models, and will have a plug on the unused port.

Water Valve Assembly Removal

1. Turn off the water supply to the refrigerator.
2. Raise the machine compartment grill.
3. Disconnect the water lines from each valve.

NOTE: The water line labeled blue connects to the isolation valve (orange collar) and the water line labeled red connects to the ice and water valve (brown collar).

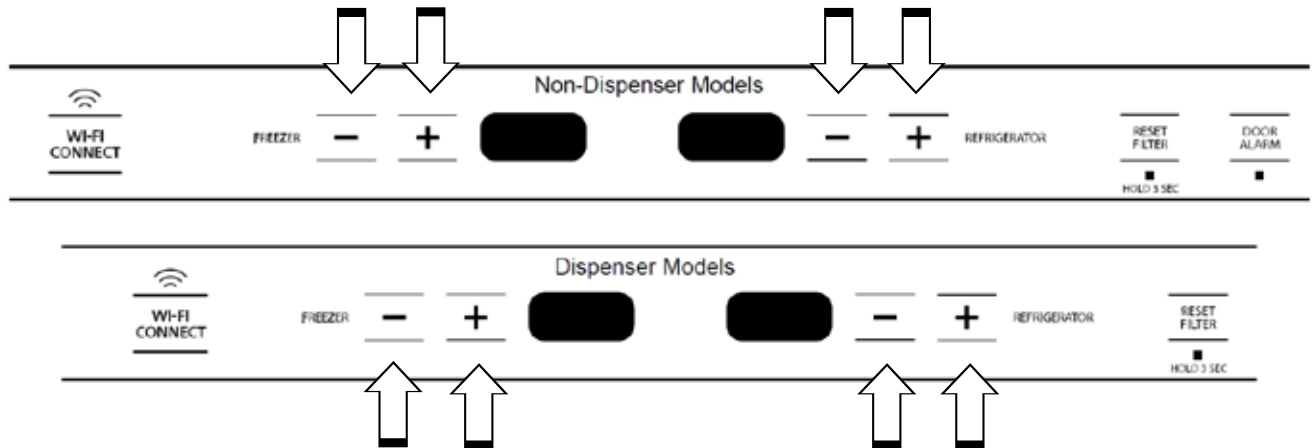
4. Remove the water line from the isolating valve using a 1/2 in. wrench.
5. Remove the Phillips head screw securing the valve assembly to the cabinet mounting bracket.



6. Disconnect the harness connectors.

Diagnostic Mode

Enter the diagnostic (service) mode by pressing both freezer temperature pads (+ and -) and the refrigerator temperature pads (+ and -) simultaneously for approximately three seconds. The display will blink **0** in the freezer temperature display and **00** in the fresh food display to indicate the refrigerator has entered diagnostic mode. All components will turn off and dampers will go to the closed position.



Use the freezer + and - buttons to increment or decrement the test selections by 10, and use the fresh food + and - buttons to increment or decrement the test selections by 1. Press any key other than the temperature adjust keys to run the selected test. The test mode must be selected within 5 minutes of entering the diagnostic mode or it will time-out and normal refrigeration operation will resume.

Once a test mode is selected, the display will show the results of the mode selected.

In test 0 00 (fault codes), a fault code information will scroll in the display. The fault code will be displayed first xx xx (example: 04 03). Then how many times the fault occurred xx xo is displayed (example: 01 2o = twelve times). Lastly, how many days ago the fault last happened xx xd is displayed (example: 00 2d = two days ago).

Use the refrigerator temperature pads to scroll through fault codes should more than one fault be present. Press the Filter Reset pad to return to diagnostic tests.

Run test 0 16 to exit Service Mode and return to normal operation. The control will reset to normal operation if power is cycled.

Diagnostic Tests

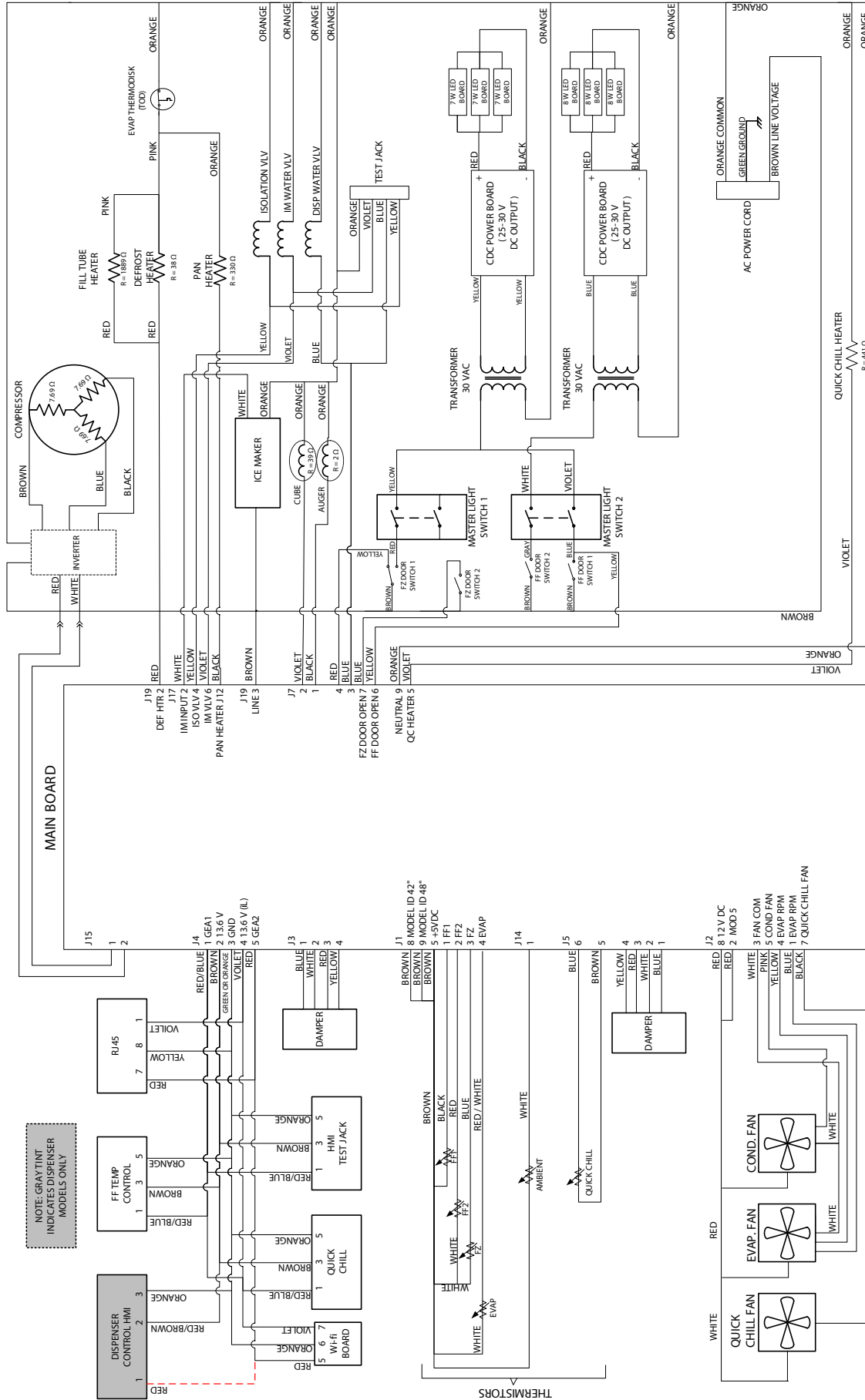
Enter the appropriate display numbers as shown below and press any pad other than the + or - pads to activate that test mode.

FZ Display	FF Display	Mode	Comments
0	0	Displays Fault Codes	
0	1	Clears Fault Codes	Clears all fault codes after repairs are complete
0	7	Degrees Celsius mode	Changes the display to degrees Celsius
0	8	Degrees Fahrenheit mode	Changes the display to degrees Fahrenheit
0	14	Force defrost	Starts a defrost cycle
0	15	Exit defrost	Forces the heated defrost to an idle state
0	16	Exit Service Mode	Resets all boards in the system
0	18	Dispenser Version Test	Confirm communication to UI boards.
0	20	Internal Temperature Board Version test	
0	23	Mainboard Version Test	
0	24	FF1 Thermistor Test	
0	25	FF2 Thermistor test	Display the instantaneous temperature of the thermistor. Display of 300 or -41 indicates open/shorted or not present. If the thermistor is out of range, "--" will be displayed. Example: 10 27 = 10.27 degrees
0	27	FZ Thermistor test	
0	28	FZ Evap. Thermistor Test	
0	33	Quick Chill Thermistor Test	
0	43	Cycle Duct Door	Opens the duct door for 10 seconds and then closes it.
0	44	Cycle FF Damper	Opens the damper for 30 seconds and the closes it.
0	46	Cycle QC Damper	
0	48	Freezer Fan Test	Turns the fan on 75% duty cycle and the RPM is displayed
0	49	Condenser Fan Test	Turns the fan on 75% duty cycle (no RPM displayed)
0	51	Quick Chill Fan test	Turns the fan on 100% duty cycle (no RPM displayed)
0	54	Quick Chill Heater Test *	Turns on the load *Quick Chill heater only on for 30 seconds.
0	55	Isolation Valve Test	
0	57	Water Dispenser Valve Test	
0	58	Icemaker Valve Test	
0	60	Defrost Heater Test	
0	61	Compressor Relay Test	
0	62	Defrost Pan Heater Test	
0	71	Read FF Door Status	Returns the Input Status (0 = Closed, 1 = Open)
0	72	Read FZ Door Status	
0	73	Icemaker Input Status	
0	93	Defrost Heater Test with Feedback	Turns on defrost heater and displays the evaporator thermistor temperature. The test will terminate when the evaporator thermistor reaches 80°F
0	96	FZ Cooling Test	Compressor On - Condenser Fan High - FZ Fan Low - Display Evaporator Thermistor Temperature
1	3	Ice Dispenser Auger Test	Turns on the relay to operate the load.
1	4	Ice Dispenser Crusher Test	

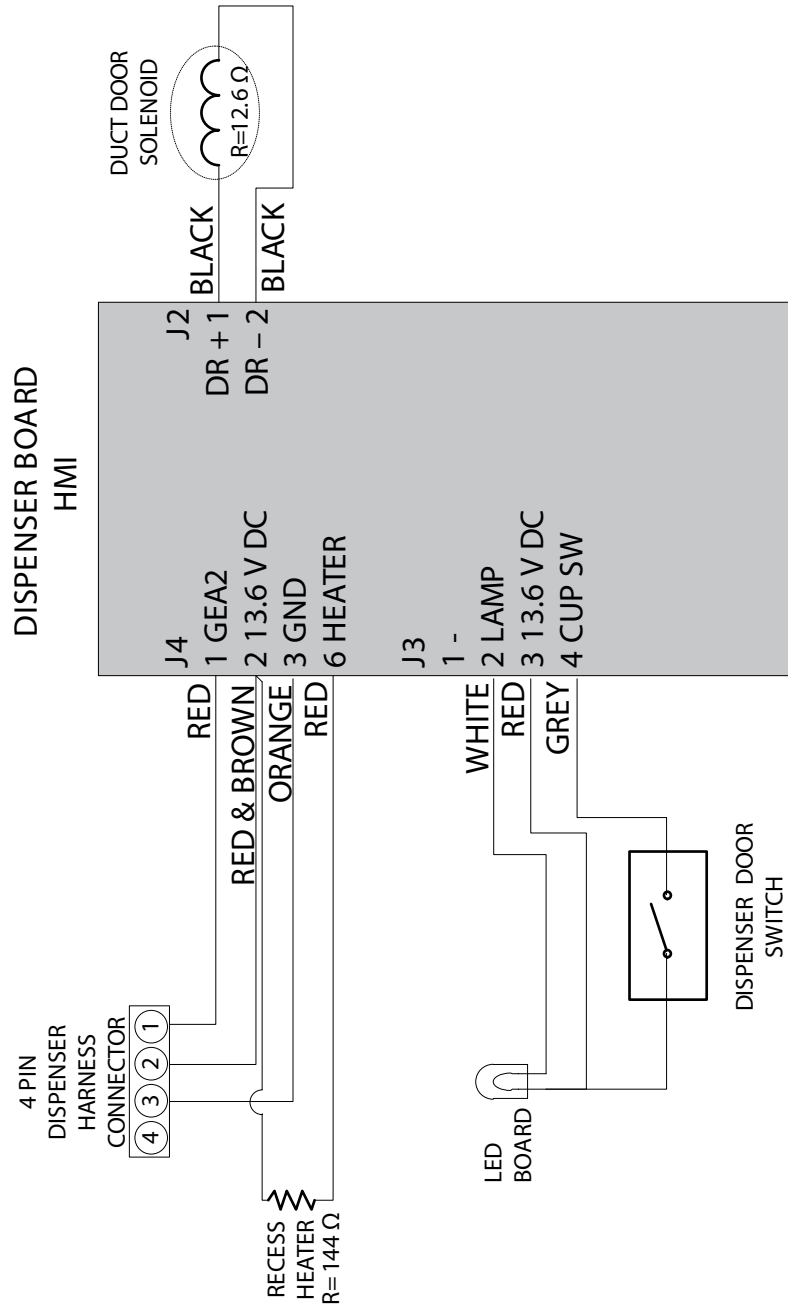
Fault Codes

Group	Display	Fault Code Definition
Thermistor (1 - 99)	0001	FF1 thermistor reading out of range
	0002	FF2 thermistor reading out of range
	0003	FZ thermistor reading out of range
	0004	FZ evaporator thermistor reading out of range
	0008	Ambient temperature thermistor reading out of range
	0013	Quick Chill thermistor reading out of range
Fans (100 - 199)	0100	FZ fan feedback missing when the fan is running
	0101	FZ fan feedback present when fan is off
	0102	FZ fan cannot reach target speed
Defrost System (200 - 299)	0200	FZ defrost heater timed out (check FZ evaporator thermistor fault code 0004)
	0202	5 consecutive FZ abnormal defrosts
Sealed System (300 - 399)	0300	Compressor ran continuously for 24 hours
	0301	Temperature satisfied > 3 hours (no compressor operation)
	0302	FF temperature below freezing
	0303	FF temperature exceeds 20F over Setpoint, 1 hour post defrost or door opening
	0304	FZ temperature exceeds 20F over Setpoint, 1 hour post defrost or door opening
	0307	Damper driver fault (this Fault code not available on some software versions)
Main Board (400 - 499)	0401	Dispenser paddle switch pressed > 7 minutes
	0403	Mainboard software fault
	0404	Mainboard hardware fault
Icemaker (600 - 699)	0654	FZ IM no water supply detected
External Interaction (700 - 799)	0700	Stuck keys on dispenser boards
	0701	Stuck keys on internal temperature board
	0703	Key press on temperature board while door is closed
	0713	FF door open for 15 minutes continuously
	0714	FF door open for 60 minutes total in the last 24 hours
	0715	50 FF door openings in the last 24 hours
	0717	FZ door open for 15 minutes continuously
	0718	FZ door open for 60 minutes total in the last 24 hours
	0719	50 FZ door openings in the last 24 hours

Schematics



Dispenser Schematic Diagram



Monogram Refrigerator Warranty



All warranty service provided by our Factory Service Centers or an authorized Customer Care® technician. To schedule service, visit us on-line at GEAppliances.com, or call 800.GE.CARES (800.432.2737). For service in Canada, contact Gordon Williams Corp. at 1.888.209.0999. Please have serial number and model number available when calling for service.

*Staple your receipt here.
Proof of the original purchase
date is needed to obtain service
under the warranty.*

For The Period Of:	GE Appliances Will Replace:
LIMITED TWO-YEAR WARRANTY	For two years from date of original purchase, we will provide, free of charge, parts and service labor in your home to repair or replace any part of the refrigerator that fails because of a manufacturing defect.
LIMITED FIVE-YEAR WARRANTY	For five years from date of original purchase, we will provide, free of charge, parts and service labor in your home to repair or replace any part of the sealed refrigerating system (the compressor, condenser, evaporator and all connecting tubing) that fails because of a manufacturing defect.
LIMITED ADDITIONAL SIXTH- THROUGH TWELFTH-YEAR WARRANTY ON THE SEALED SYSTEM	For the sixth through twelfth year from the date of the original purchase, we will provide, free of charge, replacement parts for any part of the sealed refrigerating system (the compressor, condenser, evaporator and all connecting tubing) that fails because of a manufacturing defect. You pay for the service trip to your home and for service labor charges.
LIMITED THIRTY-DAY WARRANTY ON WATER FILTER CARTRIDGE Appliances (Water filter, if included)	From the date of the original purchase we will provide, free of charge, replacement parts for any part of the water filter cartridge that fails because of a manufacturing defect. During this limited thirty-day warranty, we will also provide, free of charge, a replacement water filter cartridge.

In Alaska the warranty is the same except that it is LIMITED because you must pay to ship the product to the service shop or for the service technician's travel costs to your home.

All warranty service will be provided by our Factory Service Centers or by our authorized Customer Care® servicers during normal working hours.

Should your appliance need service, during warranty period or beyond, in the USA call 800.432.2737. In Canada: 800.561.3344. Please have your serial number and model number available when calling for service.

What GE Will Not Cover:

- Improper installation, delivery or maintenance. If you have an installation problem, contact your dealer or installer. You are responsible for providing adequate electrical, plumbing and other connecting facilities.
- Damage caused after delivery.
- Damage to product caused by improper power supply voltage, accident, fire, flood, or acts of God.
- Failure of the product if it is used for other than its intended purpose or used commercially.
- Product not accessible to provide required service.
- Replacement of the light bulbs, if included, or water filter cartridge, if included, other than as noted above.
- Replacement of fuses or resetting of circuit breakers.
- Replacement of the water filter cartridge, if included, due to water pressure that is outside the specified operating range or due to excessive sediment in the water supply.
- Loss of food due to spoilage (in the USA only).
- Incidental or consequential damage caused by possible defects with this appliance.
- Damage caused by a non-GE Appliances brand water filter.
- Service trips to your site to teach you how to use the product.
- Damage to finish, such as surface rust, tarnish, or small blemishes not reported within 48 hours of delivery.

EXCLUSION OF IMPLIED WARRANTIES – Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

This warranty is extended to the original purchaser and any succeeding owner for products purchased for ordinary home use in the 48 mainland states, Hawaii, Washington, D.C. or Canada. If the product is located in an area where service by a GE Appliances Authorized Servicer is not available, you may be responsible for a trip charge or you may be required to bring the product to an Authorized GE Appliances Service location for service.

Some states/provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state/province to province. To know what your legal rights are in your state/province, consult your local or state/provincial consumer affairs office or your state's Attorney General.

Warrantor in USA: GE Appliances, Louisville, KY 40225
Warrantor in Canada: Mabe Canada Inc.

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